AD_____

Award Number: DAMD17-00-2-0002

TITLE: Support for the Resident Research Associateship Program with the U.S. Army Medical Research and Materiel Command

PRINCIPAL INVESTIGATOR: Judith K. Nyquist, Ph.D.

CONTRACTING ORGANIZATION: National Research Council
Washington, DC 2001-2736

REPORT DATE: February 2006

TYPE OF REPORT: Annual

PREPARED FOR: U.S. Army Medical Research and Materiel Command
Fort Detrick, Maryland 21702-5012

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Judith K. Nyquist, Ph.D.

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**13. SUPPLEMENTARY NOTES**

**14. ABSTRACT**
For Abstract see attached individual Final reports.

**15. SUBJECT TERMS**
Infectious disease; combat casualty care; chemical and biological Medical defense; military operational medicine; biomedical research

| **16. SECURITY CLASSIFICATION OF:** | | | | **18. NUMBER OF PAGES** | **19a. NAME OF RESPONSIBLE PERSON** |
|---|---|---|---|---|---|
| | | | | | USAMRMC |
| **a. REPORT** | **b. ABSTRACT** | **c. THIS PAGE** | | | **19b. TELEPHONE NUMBER** *(include area code)* |
| U | U | U | UU | 47 | |

**Standard Form 298 (Rev. 8-98)**
**Prescribed by ANSI Std. Z39.18**

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THE NATIONAL ACADEMIES
*Advisers to the Nation on Science, Engineering, and Medicine*

Policy and Global Affairs
Associateship Programs

500 Fifth Street, NW, GR 322A
Washington, DC 20001
Phone: 202 334 2760
Fax: 202 334 2759

February 16, 2006

Ms. Judy Pawlus, Technical Editor
Office of the Deputy Chief of Staff
for Information Management
Attn: MCMR-RMI-S
504 Scott Street
Fort Detrick, MD 21702-5400

**Re: Contract No. DAMD17-00-2-0002 Technical Report**

Dear Ms. Pawlus:

The enclosed technical report is to fulfill our contractual obligations for:

| | |
|---|---|
| Contract | **DAMD17-00-2-0002** |
| Cost Center | **3556** |
| Title | **U.S. Army Medical Research and Materiel Command Resident Research Associateship Program** |
| Contract Period | **1/24/2000 – 3/23/2007** |

The report covers the period January 24, 2005, through January 23, 2006. This report fulfills contractual requirements for technical reports. The original report and three copies are enclosed for your use.

Sincerely yours,

Judith K. Nyquist

Judith K. Nyquist, Ph.D.
Deputy Director and
Program Administrator

Enclosures

cc: Sina Bavari, Ph.D., USAMRIID Laboratory Program Representative
Michael Dubick, Ph.D., USAISR Laboratory Program Representative
Brennie E. Hackley, Jr., Ph.D., USAMRICD Laboratory Program Representative
Christopher A. Joyce, USARIEM Laboratory Program Representative
Jaques Reifman, Ph.D., CBCR Laboratory Program Representative
Sara W. Rothman, Ph.D., WRAIR Laboratory Program Representative
NAS OCG (letter)
Laboratory Contract File (letter)

THE NATIONAL ACADEMIES
*Advisers to the Nation on Science, Engineering, and Medicine*

# National Research Council
**RESEARCH ASSOCIATESHIP PROGRAM**

**with the**

**U.S. Army Medical Research and Materiel Command**

**Annual Contract Technical Report**

**1/24/2005 – 1/23/2006**

**DAMD17-00-2-0002**

## Publicity

The National Academies Research Associateship Programs for the reporting period were announced to the scientific community, beginning in the fall of the preceding year. Publicity materials describing the National Research Council-U.S. Army Medical Research and Materiel Command (AMRMC) Programs were distributed in November to presidents, graduate deans, and heads of appropriate science and engineering departments and minority-affairs offices of all academic degree-granting institutions in the United States. An e-mail announcement of the programs was sent to these same contact points prior to each review deadline. Promotional materials were sent to Laboratory Program Representatives, Associateship Advisers, and other interested persons. General advertisements of programs were placed in leading scientific and engineering publications. Publicity materials and other related information were made available on the internet. Research Associateship Programs staff attended numerous professional scientific and engineering meetings and minority recruitment events to promote the various programs and to meet with prospective applicants throughout the year.

## Requests

Application materials were distributed in response to specific requests for information about the AMRMC Research Associateship Program or as a result of general requests by persons whose fields of specialization appeared to be appropriate for the research opportunities available in the AMRMC laboratories.

## Competition

Panel reviews of applicants for the Research Associateship Programs, including those with the U.S. Army Medical Research and Materiel Command, are conducted four times each year. The following is a breakdown of the action taken with the applications to the U.S. Army Medical Research and Materiel Command during the reporting period.

| | Mar review of Feb app-05 | May review of June app-05 | Sept review of Aug app-05 | Jan review of Nov app-05 | TOTAL |
|---|---|---|---|---|---|
| **TOTAL APPLICATIONS** | **5** | **13** | **10** | **4** | **32** |
| **Number of Applications Not Reviewed** | **2** | **3** | **2** | **0** | **7** |
| **Number of Applications Reviewed** | **3** | **10** | **8** | **4** | **25** |
| Awards offered & accepted | 2 | 7 | 4 | 1 | 14 |
| Applications not recommended (did not pass Review) | 1 | 1 | 0 | 0 | 2 |
| Recommended/no lab funds available | 0 | 0 | 1 | 0 | 1 |
| Recommended/pending further lab action | 0 | 1 | 3 | 3 | 7 |
| Awards withdrawn by RAP (NRC officially withdrew award *after* it had been accepted.) | 0 | 1 | 0 | 0 | 1 |

## Associates' Citizenship

Associates on tenure between January 24, 2005, and January 23, 2006 were citizens of the following countries:

| | | | | | |
|---|---|---|---|---|---|
| **39** | **U.S. citizens** | **11** | **J-1 research scholars** | **0** | **J-1 short-term scholars** |
| **2** | **U.S. permanent residents** | 2 | Australia | | |
| 1 | India | 1 | Belarus | **0** | **F-1 students** |
| 1 | Russia | 1 | France | | |
| | | 1 | Ghana | | |
| | | 2 | Israel | | |
| | | 1 | New Zealand | | |
| | | 1 | People's Republic of China | | |
| | | 2 | Russia | | |

## Associates' Activities

Associates who ended tenure during the report period were on tenure for an average of 30 months, ranging from 10 months to 44 months.

Of the 14 Associates who ended tenure during the report period, 9 (64%) submitted final reports. In the final reports, Associates indicated the following scholarly activity while on tenure.

**24** Articles published in peer-reviewed journals
**7** Patent applications
**18** International presentations
**34** Domestic presentations
**3** Awards

After ending their tenure, Associates indicated their future plans as follows:

**0** Remain at host agency as perm. employee
**3** Remain at host agency as contract employee
**0** Research position at other US gov't. lab
**0** Administrative position at US gov't. lab
**0** Research position at foreign gov't. lab
**1** Research/teaching-US college/university
**1** Research/teaching-foreign college/university
**1** Research/admin in industry
**1** Research/admin in non-profit organization
**1** Postdoctoral research
**0** Self employed
**1** Other (may include unemployed)

In their final reports, Associates were asked to evaluate certain aspects of their experiences on a scale of 1 (low) to 10 (high). The average rating for each item follows:

| | | |
|---|---|---|
| **9.3** | *Short-term value* | Development of knowledge, skills, and research productivity |
| **9.6** | *Long-term value* | How your Research Associateship affected your career to date |
| **--** | *Laboratory Support* | Equipment, funding, orientation, safety and health training, etc. |
| **--** | *Adviser Mentoring* | Quality of mentoring from the Research Adviser |
| **9.9** | *LPR* | Quality of administrative support from the LPR |
| **9.6** | *NRC* | Quality of administrative support from the NRC |

Advisers also were asked to complete an evaluation of the Associate. The following summarizes the Adviser evaluations for Associates ending tenure during the report period. Of the 14 Associates who ended tenure, 5 (36%) Adviser evaluations were completed. Assessments were made on six criteria using the following rating scale: 1-below average, 2-average, 3-above average, 4-good, and 5-outstanding/exceptional. The average rating for each item follows:

**3.6** Knowledge of field
**3.6** Innovative thinking
**4.0** Research techniques
**3.8** Independence
**3.8** Motivation
**3.8** Overall scientific ability

The Adviser was asked, "Would you like this Associate as a professional colleague?" The Advisers responded in the following manner:

**4** Yes
**--** No
**1** No Comment
**--** No Answer

Additional information about the Associates' activities can be found in the attachments described below and the Appendix.

*Attachment 1:* Associates who were on tenure between January 24, 3005, and January 23, 2006. Included are the Associate's laboratory center/division location, the starting and termination dates, and the names of their advisers. For those Associates who ended tenure during the report period, it is noted if the final and adviser evaluation reports have been received. Associates are required to submit final reports upon termination of tenure, and advisers are asked to submit a final evaluation of each Associate. Associates who have not submitted a final report have received follow-up correspondence.

*Attachment 2:* All recommended candidates by category (e.g., Recommended, Accepted, No Funding, Declined, etc.). This report includes information about citizenship, the PhD institution, the title of proposed research, proposed or actual starting date, and adviser.

*Attachment 3:* Summaries of Associate patent activity, if any, and Associate research during tenure as reported on the Associates' termination reports. The summary of patent activity includes the patent application title, inventor(s), and date of application.

*Appendix:* Final reports received from the Associates who ended tenure during the report period.

## Associates On Tenure 1/24/2005 - 1/23/2006 Attachment 1

### U.S. Army Medical Research and Materiel Command



| Associate Name+ Adviser | Center | Tenure Dates Start/End | Termination Report | Adviser Report |
|---|---|---|---|---|
| Allon, Nahum<br>*Dr. Bhupendra P. Doctor* | Walter Reed Army Institute of Research | 10/11/2005 - 10/10/2006 | | |
| Beitzel, Brett Forrest<br>*Dr. Connie S. Schmaljohn* | U.S. Army Medical Research Institute of Infectious Diseases | 1/12/2004 - 1/11/2007 | | |
| Bhonsle, Jayendra Bhausaheb<br>*Dr. Apurba K. Bhattacharjee* | (S) Walter Reed Army Institute of Research | 7/6/2004 - 7/5/2006 | | |
| Bradfute, Steven Blake<br>*Dr. Thomas W. Geisbert* | U.S. Army Medical Research Institute of Infectious Diseases | 2/16/2005 - 2/15/2007 | | |
| Brittingham, Katherine Tracey Cecil<br>*Dr. Sina Bavari* | U.S. Army Medical Research Institute of Infectious Diseases | 9/11/2003 - 9/10/2006 | | |
| Cashman, Kathleen Anne<br>*Dr. Mary C. Guttieri* | U.S. Army Medical Research Institute of Infectious Diseases | 7/11/2005 - 7/10/2006 | | |
| Chen, Yue-Qin<br>*Dr. Thomas H. Hudson* | (S) Walter Reed Army Institute of Research | 2/11/2003 - 6/10/2005 | Received | Received |
| Cote, Christopher Kevin<br>*Dr. Susan L. Welkos* | U.S. Army Medical Research Institute of Infectious Diseases | 4/29/2002 - 10/28/2005 | Received | Received |
| Curtis, Kristopher Michael<br>*Dr. Thomas W. Geisbert* | U.S. Army Medical Research Institute of Infectious Diseases | 8/15/2003 - 8/14/2006 | | |
| Dupuy, Lesley Conrad, Jr<br>*Dr. Connie S. Schmaljohn* | U.S. Army Medical Research Institute of Infectious Diseases | 5/2/2003 - 5/1/2006 | | |
| Emerson, Ginny Leigh<br>*Dr. Robert G. Ulrich* | U.S. Army Medical Research Institute of Infectious Diseases | 3/1/2004 - 2/28/2006 | | |
| Filippov, Andrei Alexandrovich<br>*Dr. Luther E. Lindler* | (S) Walter Reed Army Institute of Research | 7/18/2005 - 7/17/2006 | | |
| Foley, Desmond Hector<br>*Dr. Richard C. Wilkerson* | (S) Walter Reed Army Institute of Research | 2/17/2004 - 2/16/2006 | | |
| Fritz, Elizabeth Ann<br>*Dr. Lisa E. Hensley* | U.S. Army Medical Research Institute of Infectious Diseases | 3/3/2003 - 9/2/2006 | | |
| Ghosh, Kashinath<br>*Dr. Edgar D. Rowton* | (S) Walter Reed Army Institute of Research | 8/1/2005 - 7/31/2006 | | |
| Goff, Arthur James<br>*Dr. Lisa E. Hensley* | U.S. Army Medical Research Institute of Infectious Diseases | 8/20/2004 - 8/19/2006 | | |
| Golden, Joseph Walter<br>*Dr. Jay W. Hooper* | U.S. Army Medical Research Institute of Infectious Diseases | 4/4/2005 - 4/3/2006 | | |
| Hoard-Fruchey, Heidi Marie<br>*Dr. Michael Adler* | U.S. Army Medical Research Institute of Chemical Defense | 7/19/2004 - 7/18/2006 | | |
| Jensen, Victoria Margaret<br>*Dr. Jay W. Hooper* | U.S. Army Medical Research Institute of Infectious Diseases | 7/19/2004 - 7/18/2006 | | |
| Jirage, Dayadevi Balappa<br>*Dr. Norman C. Waters* | (S) Walter Reed Army Institute of Research | 8/22/2005 - 8/21/2006 | | |
| Johnson, Erik Andrew<br>*Dr. Robert K. Kan* | U.S. Army Medical Research Institute of Chemical Defense | 1/3/2005 - 1/2/2007 | | |
| Jung, Bruce John<br>*Dr. Tsung-Ming A. Shih* | U.S. Army Medical Research Institute of Chemical Defense | 7/14/2003 - 1/6/2006 | Not Recd | Not Recd |

+ (S) indicates the associate was a Senior.

Highlighted entries indicate no intry on the Award Init Screen but data on the Post Tenure Screen.

| Associate Name+ Adviser | Center | Tenure Dates Start/End | Termination Report | Adviser Report |
|---|---|---|---|---|
| Silvestri, Lynn Shiels *Dr. Sina Bavari* | U.S. Army Medical Research Institute of Infectious Diseases | 9/7/2004 - 9/6/2006 | | |
| Swanson, Katherine Irene *Dr. Russell E. Coleman* | Walter Reed Army Institute of Research | 11/21/2005 - 11/20/2006 | | |
| Swenson, Dana Linne *Dr. Sina Bavari* | (S) U.S. Army Medical Research Institute of Infectious Diseases | 3/13/2002 - 11/12/2005 | Received | Received |
| Taylor, Shannon Lynn *Dr. Connie S. Schmaljohn* | U.S. Army Medical Research Institute of Infectious Diseases | 6/8/2005 - 6/7/2006 | | |
| Tonduli, Laura Sabina *Dr. Bhupendra P. Doctor* | Walter Reed Army Institute of Research | 2/17/2004 - 2/16/2007 | | |
| Warfield, Kelly Lyn *Dr. Sina Bavari* | U.S. Army Medical Research Institute of Infectious Diseases | 6/17/2002 - 9/29/2005 | Received | Received |
| Wilson, Paul Anthony *Dr. Jaques Reifman* | Center for Biomedical Computations Research | 12/1/2005 - 11/30/2006 | | |
| Yershov, Andrey Lvovich *Dr. Michael A. Dubick* | (S) U.S. Army Institute of Surgical Research | 10/15/2001 - 4/12/2005 | Not Recd | Not Recd |
| Zollner, Gabriela Elaine *Dr. James W. Jones* | Walter Reed Army Institute of Research | 4/22/2002 - 2/21/2005 | Received | Not Recd |

53 Associates Listed

+ (S) indicates the associate was a Senior.

Highlighted entries indicate no intry on the Award Init Screen but data on the Post Tenure Screen.

| Associate Name+ Adviser | Center | Tenure Dates Start/End | Termination Report | Adviser Report |
|---|---|---|---|---|
| Kaba, Stephen Abanega<br>*Dr. David E. Lanar* | Walter Reed Army Institute of Research | 8/1/2005 - 7/31/2006 | | |
| Kalina, Warren Vincent<br>*Dr. Alan L. Schmaljohn* | U.S. Army Medical Research Institute of Infectious Diseases | 9/10/2004 - 9/9/2006 | | |
| Keener, William Kelvin<br>*Dr. Mark A. Poli* | (S) U.S. Army Medical Research Institute of Infectious Diseases | 10/1/2004 - 9/30/2006 | | |
| Klas, Sheri Denet<br>*Dr. Robert G. Ulrich* | U.S. Army Medical Research Institute of Infectious Diseases | 12/6/2004 - 12/5/2006 | | |
| Kremenevskiy, Igor<br>*Dr. Anthony E. Pusateri* | U.S. Army Institute of Surgical Research | 9/6/2005 - 9/5/2006 | | |
| Lackner, Daniel Francis<br>*Dr. Alan L. Schmaljohn* | U.S. Army Medical Research Institute of Infectious Diseases | 6/3/2002 - 6/2/2005 | Not Recd | Not Recd |
| Langston, Jeffrey Lamar<br>*Dr. Gary A. Rockwood* | U.S. Army Medical Research Institute of Chemical Defense | 5/12/2003 - 5/11/2006 | | |
| Leader, Haim Nissan<br>*Dr. Richard K. Gordon* | (S) Walter Reed Army Institute of Research | 11/4/2002 - 11/2/2005 | Received | Received |
| McClung, James Page<br>*Dr. Andrew J. Young* | U.S. Army Research Institute of Environmental Medicine | 3/22/2004 - 12/9/2005 | Not Recd | Not Recd |
| Minsavage, Gary Dominic<br>*Dr. James F. Dillman, III* | U.S. Army Medical Research Institute of Chemical Defense | 9/1/2004 - 11/18/2005 | Received | Received |
| Miroshnikova, Olga Vyatcheslavovn<br>*Dr. Ai J. Lin* | Walter Reed Army Institute of Research | 2/25/2003 - 2/24/2006 | | |
| Morefield, Garry Lee<br>*Dr. Robert G. Ulrich* | U.S. Army Medical Research Institute of Infectious Diseases | 5/12/2004 - 5/11/2006 | | |
| Nephew, Benjamin C.<br>*Dr. Lisa R. Leon* | U.S. Army Research Institute of Environmental Medicine | 10/12/2004 - 8/26/2005 | Received | Received |
| Nicoll, William Stanley<br>*Dr. David E. Lanar* | Walter Reed Army Institute of Research | 4/1/2005 - 3/31/2006 | | |
| Noble, Schroeder Marie<br>*Dr. Donald P. Huddler* | Walter Reed Army Institute of Research | 10/4/2005 - 10/3/2006 | | |
| O'Brien, David Kenneth<br>*Dr. Arthur M. Friedlander* | U.S. Army Medical Research Institute of Infectious Diseases | 7/1/2003 - 6/30/2006 | | |
| Pearson, Brooke<br>*Dr. Arthur M. Friedlander* | U.S. Army Medical Research Institute of Infectious Diseases | 7/14/2003 - 7/13/2006 | | |
| Picchioni, Dante<br>*Dr. Thomas J. Balkin* | Walter Reed Army Institute of Research | 7/5/2005 - 7/4/2006 | | |
| Rickards, Caroline Alice<br>*Dr. Victor A. Convertino* | U.S. Army Institute of Surgical Research | 5/31/2005 - 5/30/2006 | | |
| Rupp, Tracy Lynn<br>*Dr. Thomas J. Balkin* | Walter Reed Army Institute of Research | 1/23/2006 - 1/22/2007 | | |
| Sharkey, Curtis Matthew<br>*Dr. Sina Bavari* | U.S. Army Medical Research Institute of Infectious Diseases | 7/12/2004 - 6/30/2005 | Not Recd | Not Recd |
| Shurtleff, Amy Christine<br>*Dr. Mary C. Guttieri* | U.S. Army Medical Research Institute of Infectious Diseases | 5/21/2002 - 5/20/2005 | Received | Received |

+ (S) indicates the associate was a Senior.

Highlighted entries indicate no intry on the Award Init Screen but data on the Post Tenure Screen.

**U.S. Army Medical Research and Materiel Command**

## February 2005

**A- Accepted Award** ( 2 Applicants listed)

KABA, STEPHEN A — Ph.D. Date: 2003
Citizenship: Ghana — Netherlands Unknown
Adviser: Dr. David E. Lanar — Actual Starting Date: 8/01/05
Research Field: Immunology — Termination Date: 7/31/06
Research Title: Nanoparticle Displayed Peptides as Malaria Vaccines

TAYLOR, SHANNON L — Ph.D. Date: 2004
Citizenship: United States — SUNY Health Science Ctr-Syracuse
Adviser: Dr. Connie S. Schmaljohn — Actual Starting Date: 6/08/05
Research Field: Virology — Termination Date: 6/07/06
Research Title: Hemorrhagic Fever Viruses and Antagonism of the Interferon Pathway

## May 2005

**1- Recommended**

GUERNAOUI, SOUAD — Ph.D. Date: 2005
Citizenship: Morocco — Inst Francais De Recherche/France
Adviser: Dr. Russell E. Coleman
Research Field: Entomology Parasitology
Research Title: Chorology and Molecular Characterization of Leishmania Parasites and their Vectors in Iraq and Afghanistan

**A- Accepted Award** ( 7 Applicants listed)

ALLON, NAHUM — Ph.D. Date: 1980
Citizenship: Israel — Tel Aviv University/Israel
Adviser: Dr. Bhupendra P. Doctor — Actual Starting Date: 10/11/05
Research Field: Medical Biochemistry — Termination Date: 10/10/06
Research Title: Development of Liposome Base Gene Delivery System

GHOSH, KASHINATH — Ph.D. Date: 1992
Citizenship: United States — University of Calcutta/India
Adviser: Dr. Edgar D. Rowton — Actual Starting Date: 8/01/05
Research Field: Entomology Parasitology — Termination Date: 7/31/06
Research Title: Natural Flora of Phlebotomus Papatasi and its Possible Use in Paratransgenesis

JIRAGE, DAYADEVI B — Ph.D. Date: 1999
Citizenship: India — University of Maryland
Adviser: Dr. Norman C. Waters — Actual Starting Date: 8/22/05
Research Field: Molecular Biology — Termination Date: 8/21/06
Research Title: Elucidation of Mechanisms of Cell Cycle Control in the Malaria Parasite Plasmodium falciparum

## May 2005

**A- Accepted Award** ( 7 Applicants listed)

KREMENEVSKIY, IGOR
Citizenship: Belarus
Adviser: Dr. Anthony E. Pusateri
Research Field: Experimental Medicine
Research Title: Effect of Activated Recombinant Factor VII (rFVIIa) Administration on Survival in Swine during Hypovolemic Shock and Uncontrolled Hemorrhage
Ph.D. Date: 2004
Belarus Unknown
Actual Starting Date: 9/06/05
Termination Date: 9/05/06

NOBLE, SCHROEDER M
Citizenship: United States
Adviser: Dr. Donald P. Huddler
Research Field: Biochemistry Biophysics
Research Title: Structural Studies of the HSP90 Molecular Chaperone for the Development of Novel Inhibitors
Ph.D. Date: 2005
U of North Carolina-Chapel Hill
Actual Starting Date: 10/04/05
Termination Date: 10/03/06

PICCHIONI, DANTE
Citizenship: United States
Adviser: Dr. Thomas J. Balkin
Research Field: Experimental Psychology
Research Title: Predicting Individual Differences in Response to Sleep Deprivation
Ph.D. Date: 2005
Univ of Southern Mississippi
Actual Starting Date: 7/05/05
Termination Date: 7/04/06

SWANSON, KATHERINE I
Citizenship: United States
Adviser: Dr. Russell E. Coleman
Research Field: Entomology
Research Title: Determination of Genetic Diversity of Phlebotomine Sand Flies and Leishmania Parasites in Iraq and Afghanistan
Ph.D. Date: 2005
Johns Hopkins University/MD
Actual Starting Date: 11/21/05
Termination Date: 11/20/06

**W- Withdrew after Review/Recommend**

RICHARDS, STEPHANIE L
Citizenship: United States
Adviser: Dr. Russell E. Coleman
Research Field: Entomology
Research Title: Spatial Analysis of Environmental Variables in Relation to the Distribution of Phlebotomine Sand Flies (Diptera: Psychodidae) Infected with 'Leishmania' in Iraq
Ph.D. Date: 2005
North Carolina State U-Raleigh

## August 2005

**Z- Recommended/No Funding**

GRABKO, VLADIMIR I
Citizenship: Russia
Adviser: Dr. Wendell D. Zollinger
Research Field: Bacteriology Pub Health
Research Title: Expression of Recombinant Proteins of Neisseria Meningitis
Ph.D. Date: 1975
Inst Molecular Bio & Genetics/Ukr

## August 2005

**1- Recommended** ( 3 Applicants listed)

GOVINDARAJ, KRISHNAMURTHY — Ph.D. Date: 1997
Citizenship: India — All India I Med Sci
Adviser: Dr. George C. Tsokos
Research Field: Medicine
Research Title: Induction of Effective and Long-lasting Protective Immune Response to the Malaria Circumsporozoite Protein

SPRING, MICHELE D — Ph.D. Date: 1999
Citizenship: United States — Vanderbilt Univ-Sch of Med/TN
Adviser: Dr. David E. Lanar
Research Field: Immunoparasitology
Research Title: Analysis of Immune Responses to Apical Membrane Antigen-1 (AMA-1) in Human

WEEKS, CHRISTINE M — Ph.D. Date: 2003
Citizenship: United States — Harvard Univ Medical School/MA
Adviser: Dr. George C. Tsokos
Research Field: Immunology
Research Title: Modulation of Gut Ischemia-Reperfusion Injury in Mice by Selective B-Lymphocyte Depletion with Anti-CD20 Monoclonal Antibody

**A- Accepted Award** ( 4 Applicants listed)

GLYNN, AUDREY R — Ph.D. Date: 2005
Citizenship: United States — Tulane University of Louisiana
Adviser: Dr. Douglas S. Reed — Expected Starting Date: 7/02/06
Research Field: Immunology — Termination Date: 7/01/07
Research Title: An In Vivo Non-Human Primate Model for Studying the Th1/Th2 Response of a Candidate Plague Vaccine

JONES, JULI E — Ph.D. Date: 2002
Citizenship: United States — U of Massachusetts-Amherst
Adviser: Dr. Allen Cymerman — Actual Starting Date: 2/06/06
Research Field: Applied Biology — Termination Date: 2/05/07
Research Title: Effect of Erythropoietin Administration on the Prevention of AMS and Cognitive Performance Deficits in Humans Ascending to High Altitude

RUPP, TRACY L — Ph.D. Date: 2005
Citizenship: United States — Brown University/RI
Adviser: Dr. Thomas J. Balkin — Actual Starting Date: 1/23/06
Research Field: Fatigue — Termination Date: 1/22/07
Research Title: Promotion of Rapid Performance Recovery Following Sleep Restriction

## August 2005

**1- Recommended** ( 3 Applicants listed)

GOVINDARAJ, KRISHNAMURTHY — Ph.D. Date: 1997
Citizenship: India — All India I Med Sci
Adviser: Dr. George C. Tsokos
Research Field: Medicine
Research Title: Induction of Effective and Long-lasting Protective Immune Response to the Malaria Circumsporozoite Protein

SPRING, MICHELE D — Ph.D. Date: 1999
Citizenship: United States — Vanderbilt Univ-Sch of Med/TN
Adviser: Dr. David E. Lanar
Research Field: Immunoparasitology
Research Title: Analysis of Immune Responses to Apical Membrane Antigen-1 (AMA-1) in Human

WEEKS, CHRISTINE M — Ph.D. Date: 2003
Citizenship: United States — Harvard Univ Medical School/MA
Adviser: Dr. George C. Tsokos
Research Field: Immunology
Research Title: Modulation of Gut Ischemia-Reperfusion Injury in Mice by Selective B-Lymphocyte Depletion with Anti-CD20 Monoclonal Antibody

**A- Accepted Award** ( 4 Applicants listed)

GLYNN, AUDREY R — Ph.D. Date: 2005
Citizenship: United States — Tulane University of Louisiana
Adviser: Dr. Douglas S. Reed — Expected Starting Date: 7/02/06
Research Field: Immunology — Termination Date: 7/01/07
Research Title: An In Vivo Non-Human Primate Model for Studying the Th1/Th2 Response of a Candidate Plague Vaccine

JONES, JULI E — Ph.D. Date: 2002
Citizenship: United States — U of Massachusetts-Amherst
Adviser: Dr. Allen Cymerman — Actual Starting Date: 2/06/06
Research Field: Applied Biology — Termination Date: 2/05/07
Research Title: Effect of Erythropoietin Administration on the Prevention of AMS and Cognitive Performance Deficits in Humans Ascending to High Altitude

RUPP, TRACY L — Ph.D. Date: 2005
Citizenship: United States — Brown University/RI
Adviser: Dr. Thomas J. Balkin — Actual Starting Date: 1/23/06
Research Field: Fatigue — Termination Date: 1/22/07
Research Title: Promotion of Rapid Performance Recovery Following Sleep Restriction

## August 2005

**A- Accepted Award** ( 4 Applicants listed)

WILSON, PAUL A
Citizenship: United States
Adviser: Dr. Jaques Reifman
Research Field: Structural Biology
Research Title: Development of Accurate and Scalable Algorithms for Genome-wide Protein Structure Prediction

Ph.D. Date: 2004
University of Montana
Actual Starting Date: 12/01/05
Termination Date: 11/30/06

## November 2005

**1- Recommended** ( 3 Applicants listed)

DHAKED, RAM K
Citizenship: India
Adviser: Dr. Charles B. Millard
Research Field: Biochemistry
Research Title: Development of Novel Bifunctional Inhibitors Against Toxin Molecules for Biodefence

Ph.D. Date: 2004
Jiwaji University/India

NANDA, NAVREET K
Citizenship: United States
Adviser: Dr. Sina Bavari
Research Field: Immunology
Research Title: Role of HLA-DM in Host Susceptibility against Burkholderia mallei and Borkholderia pseudomallei

Ph.D. Date: 1985
All India I Med Sci

PERRONE, LUCY A
Citizenship: United States
Adviser: Dr. Lisa E. Hensley
Research Field: Infectious Diseases
Research Title: Investigating Mechanisms and Counter-measures of Coagulopathy During Marburg Virus Infection in Non-human Primates

Ph.D. Date: 2006
U of Texas, Medical Br-Galveston

**A- Accepted Award**

TOTH, STEPHEN I
Citizenship: Australia
Adviser: Dr. Syed A. Ahmed
Research Field: Structural Biology
Research Title: Structural Biology Study: Light Chain of Botulism Toxins

Ph.D. Date: 1990
University of Sydney/Australia
Expected Starting Date: 3/13/06
Termination Date: 3/12/07

## U.S. Army Medical Research and Materiel Command

*U.S. Army Medical Research and Materiel Command*

**Minsavage, Gary Dominic 9/01/2004 11/18/2005**

1 Patent Title: Novel reporter genes for toxicant screening

Co-authors: Gary D. Minsavsage and James F. Dillman
Date Applied For: Date Approved For:

2 Patent Title: Caffeic acid phenethyl ester to alter bifunctional alkylating agent-induced signaling

Co-authors: Gary D. Minsavage and James F. Dillman
Date Applied For: Date Approved For:

3 Patent Title: TNFalpha family aptamers to inhibit TNFalpha-mediated signaling

Co-authors: Gary D. Minsavage and James F. Dillman
Date Applied For: Date Approved For:

**Swenson, Dana Linne 3/13/2002 11/12/2005**

1 Patent Title: Generation of virus-like particles and use as panfilovirus vaccine.

Co-authors: Sina Bavari, M. Javad Aman, Alan L. Schmaljohn, Kelly L. Warfield, and Dana L. Swenson.
Date Applied For: 4/13/2005 Date Approved For:

## U.S. Army Medical Research and Materiel Command

**Chen, Yue-Qin** **2/11/2003 6/10/2005**

1 Molecular mechanisms of sulfur mustard induced apoptosis: Figured out the molecular mechanisms of sulfur mustard vesicant-induced cell death. Based on the findings, a model of sulphur mustard-induced apoptosis was established.
2 Experimental therapeutics of anti sulphur mustard: 3-Deaza-aristeromycin (DZAri) was found to inhibit apoptosis of keratinocytes induced by sulfur mustard efficiently. The postulated mechanisms of DZAri inhibiting apoptosis were discussed.
3 Anti-malaria therapics: Molecular target for inhibit malaria protein mature: Cloned and charactered methionine aminopeptidase 2 (MetAP2) from mice Plasmodium berghei. MetAP2 is a good candidate for molecular target design of anti-malaria.
4 Probing the active site of a plasmodial cyclin dependent protein kinase: Elicit the effect of the mutations on Pfmrk activity, identify amino acids that are essential for activity and can be exploited for structure based drug design.
5 Identification of interacting proteins with plasmodial cyclin dependent kinases using a bacterial two-hybrid system: Hits from the screen have been found that most of them are involved in DNA replication, DNA repair, gene expression, and etc.

**Cote, Christopher Kevin** **4/29/2002 10/28/2005**

1 Protective antigen (PA) was found to be associated with recently germinated spores, and the PA could not be attributed to spore purification procedures.
2 Macrophages were shown to be important for host survival of anthrax; fewer macrophages meant shorter survival time while additional macrophages augmented survival times.
3 Neither depleting or augmenting neutrophil populations significantly affected the outcome of a B. anthracis infection.
4 Neutrophils seem to have an indirect role in the host immune response to B. anthracis spores, whereas macrophages have a direct role (ie. killing or transocation of spores).
5 Spore coat proteins and proteins associated with spore germination were evaluated as potential vaccine candidates.

**Leader, Haim Nissan** **11/04/2002 11/02/2005**

1 Focused on the design and the synthesis of affinity ligans-procainamide analoges for coupling to polyurethane prepolymer (toluene diisocyanate).
2 Five psi-amino acid-procainamide ligands have been synthesized and were characterized for purity and structural elucidation by TLC and 1H and 13C NMR spectroscopy.
3 These spacer-ligand molecules were coupled through their free amino group to the polyurethane-prepolymer, which produced a cross-linked polyurethane matrix containing the affinity ligands.
4 To extend these observations, the suitability of the affinity sponge for another protein was proposed.

**Minsavage, Gary Dominic** **9/01/2004 11/18/2005**

1 Proteomics approaches revealed soman-induced tyrosine phosphorylation changes within 30 minutes of exposure.
2 Proteomics approaches revealed HI-6/atropine-induced tyrosine phosphorylation changes within 30 minutes of exposure.
3 Bifunctional alkylating agents induce p53 and nonclassical nuclear factor-kappa B (NF-kB) signaling.
4 Bifunctional alkylating agent-induced signaling is inhibited by caffeic acid phenethyl ester.
5 A common mechanism of therapeutic action against bifunctional alkylating agent may be mediated through antoxidant/electrophilic response element signaling activated by Nrf2.
6 TNFalpha family aptamers inhibit TNFalpha-mediated NF-kB activity.

**Nephew, Benjamin C.** **10/12/2004 8/26/2005**

1 Post-surgical growth in transient receptor potential vanilloid 1 (TRPV1) knockout mice does not differ from C57BL/6J wildtype mice.
2 TRPV1 receptor modulates Tc and activity following surgery.
3 TRPV1 mediates thermoregulatory responses to acute stressors such as cage change and cage switch.
4 TRPV1 mice accumulate a greater thermal load during heating than C57BL/6J wildtype mice due to an increase in ascending thermal area.
5 Despite accumulating a greater thermal load, there was no increased mortality in TRPV1 knockout mice compared to C57BL/6J wildtype controls.

## U.S. Army Medical Research and Materiel Command

**Shurtleff, Amy Christine** **5/21/2002 5/20/2005**

1 Developed a naked DNA vaccine expressing Lassa virus glycoproteins.
2 Tested protective efficacy of DNA vaccine against Lassa fever in guinea pig infection model using gene gun vaccination.
3 Developed an infection model for Lassa virus in mice.
4 Collaborated with Viropharma, Inc. and SIGA Technologies to test novel compounds with effective antiviral properties.
5 Investigated the role of serum complement activation in Lassa virus infection.

**Swenson, Dana Linne** **3/13/2002 11/12/2005**

1 Investigated the ability of virus-like particles (VLPs) to be used as vaccines for filoviral infections. Developed Ebola and Marburg VLP vaccines and showed efficacy in rodents and nonhuman primates.
2 Evaluated antisense compounds as a therapeutic for filoviral infections in vitro and in vivo. Showed efficacy of antisense compounds in rodents and nonhuman primates.

**Warfield, Kelly Lyn** **6/17/2002 9/29/2005**

1 Investigated the ability of virus-like particles (VLPs) to be used as vaccines for filoviral infections. Developed Ebola and Marburg VLP vaccines and showed efficacy in rodents and nonhuman primates.
2 Evaluated antisense compounds as a therapeutic for filoviral infections in vitro and in vivo. Showed efficacy of antisense compounds in rodents and nonhuman primates.

**Zollner, Gabriela Elaine** **4/22/2002 2/21/2005**

1 The first-generation (F1) progeny of wild-caught anophelines (from cow-baited traps) feed more readily when allowed to feed directly on human skin compared to feeding on human blood that has been placed in a membrane feeding system.
2 Following indirect membrane or direct mosquito feedings, gametocytemic patients are less infective to wild-caught mosquitoes than lab-colonized mosquitoes. The intensity of P. vivax (Pv) infection is unrelated to starting patient gametocytemia.
3 Immunofluorescent staining of Pv sexual stage parasites using anti-Pvs25 mAb is more effective than direct hemacytometer counts and Giemsa staining to determine absolute densities of ookinetes.
4 The development of mature Pv ookinetes in the midguts of lab-colonized An. dirus, An sawad. and An. minimus mosquitoes is asynchronous. Overall, parasite populations incur a 40-fold loss in abundance from the gametocyte to the oocyst lifestages.
5 Following membrane feeding with natural Pv isolates, the invasion of sporozoites into the salivary glands of An. dirus and An. minimus mosquito is highly efficient (approx. 75% and 60%, respectively).

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**Research Associateship Programs**

# *FINAL REPORT*

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|---|---|---|
| **Chen** | **YueQin** | |

| 2) *FORWARDING Address* (to which your tax statement will be mailed) | *FORWARDING Phone(s) and E-Mail* (if known) |
|---|---|
| Res. or Inst. **Biotechnology Research Center, Zhongshan University**<br>Street **Rd Xingang West 135**<br>City, State Zip **Guangzhou, Guangdong 510275, P.R.China** | **Home Phone: 86-20-84034114**<br>**Alt. Phone:**<br>**E-mail: yueqin.chen@gmail.com; lsbrc04@zsu.edu.cn** |

| 3) *Today's Date* | *Dates of Tenure* |
|---|---|
| **June 4, 2005** | from **February 11, 2003** to **June 10, 2005** |

| 4) *Agency* | *Laboratory or NASA Center* | *Division / Branch / Directorate* |
|---|---|---|
| **AMRMC** | **WRAIR** | **Experimental Therapeutics** |

5) *Name of Research Associateship Programs Adviser*

**Thomas H. Hudson**

6) *TITLE OF RESEARCH PROPOSAL*

**(1)Expression and Regulation of Genes involved in Apoptosis by Sulfur Mustard and 2-chloroethythyl**
**(2)Elicit the mechanisms of cell cycle control within the malaria parasite Plasmodium falciparum**

7) *SUMMARY OF RESEARCH DURING TENURE* **Itemize significant findings in concise form, utilizing key concepts/words.**

**1) Molecular mechanisms of sulfur mustard induced apoptosis:**
**Figured out the molecular mechanisms of sulfur mustard vesicant-induced cell death. Based on the findings, a model of sulphur mustard-induced apoptosis was established.**

**2) Experimental therapeutics of anti sulphur mustard :**
**3-Deaza-aristeromycin (DZAri) was found to inhibit apoptosis of keratinocytes induced by sulfur mustard efficiently. The postulated mechanisms of DZAri inhibiting apoptosis were discussed.**

**3) Anti-malaria therapics: Molecular target for inhibit malaria protein mature:**
**Cloned and charactered methionine aminopeptidase 2 (MetAP2) from mice Plasmodium berghei. MetAP2 is a good candidate for molecular target design of anti-malaria.**

**4) Probing the active site of a plasmodial cyclin dependent protein kinase: elicit the effect of the mutations on Pfmrk activity, identify amino acids that are essential for activity and can be exploited for structure based drug design.`**

**5) Identification of interacting proteins with plasmodial cyclin dependent kinases using a bacterial two-hybrid system :**
**Hits from the screen have been found that most of them are involved in DNA replication,DNA repair, gene expression, and etc.**

8) *RESEARCH IN PROGRESS* **Describe in no more than 100 words.**

**During current tenue, we have developed a bacterial Two-Hybrid system to identify the endogenous substrate of Pfmrk from the malaria parasite. From this screen, we have identified several proteins involved in DNA replication and cell cycle control that interact with Pfmrk. These proteins include Histone H1, Replication Licensing factor (RLF), and Replication Factor C-5 (RF-C5). All of these proteins have been shown to interact with CDKs in other eukaryotic cells which support our identification of true protein-protein interactions conserved in the malaria parasite.**

**The work in progress id to characterize those interactions with the plasmodial CDKs in an effort to support our identification of true protein-protein interactions in the malaria parasite.**

9) *PUBLICATIONS AND PAPERS RESULTING FROM NATIONAL ACADEMIES ASSOCIATESHIP RESEARCH*
**Provide complete citations: author(s), title, full name of journal, volume number, page number(s), and year of publication.**

a) **Publications in peer-reviewed journals**

b) **Books, book chapters, other publications**

c) **Manuscripts in preparation, manuscripts submitted**

1. **Sulfur mustard triggers apoptosis via activation of CDC42-MAPK pathway ( submitted)**
2. **Probing the active site of a plasmodial cyclin dependent protein kinase: the role of key amino acids in substrate and inhibitor binding (submitted)**
3. **Prophylactic Protection by 3-Deaza-aristeromycin (DZAri) against Apoptosis Induced by Sulfur Mustard in Human Keratinocytes (In preparation)**

10) *PATENT OR COPYRIGHT APPLICATIONS RESULTING FROM NATIONAL ACADEMIES ASSOCIATESHIP RESEARCH*
**Provide titles, inventors, and dates of applications.**

11) *PRESENTATIONS AT SCIENTIFIC MEETINGS OR CONFERENCES*
**Provide complete references: author(s), title, abstract/proceeding citation, meeting name and location.**

**International**

1. **Norman C. Waters, Michelle Chen, Jeanne Geyer, Sean T. Prigge Probing the active site of a plasmodial cyclin dependent protein kinase: The role Of key amino acids in substrate and inhibitor binding 2004 International Molecular Parasitology Meeting XV, September 19-23, 2004, Woods Hole, USA （Poster）**

2. **Norman C. Waters, April K. Kathcart, Edison A. Cortes, Richard A. Dennull, Apurba K. Bhattacharjee, Sean T. Prigge, Yueqin (Michelle) Chen Rational inhibtor design of Plasmodial Cyclin dependent protein kinase (CDKs) 2005 Key stone Symposia on Drugs Against Protozoan Parasites: Target Selection, Structural Biology and Medicinal Chemistry Colorado USA, April 9-13 (Poster)**

**Domestic**

1. **Yueqin(Michelle) Chen, Peter K. Chiang, William J. Smith, Thomas H. Hudson, Donald R. Skillman and Peng Zhang. 3-Deaza-aristeromycin (DZAri) Abrogates Apoptosis Induced by Sulfur Mustard in Human Keratinocytes Joint Scientific Conference on Chemical & Biological Defense Research, Towson, MD, Nov. 17-20, 2003. (Oral presentation and Poster)**

2. **Yueqin(Michelle) Chen, Diana Caridha, Peter K. Chiang, William J. Smith, and Peng Zhang Molecular mechanisms of sulfur mustard vesicant-induced cell death: early and late cell Response Joint Scientific Conference on Chemical & Biological Defense Research, Towson, MD, Nov. 17-20, 2003. (Oral presentation and Poster)**

3. **Yueqin(Michelle) Chen, Norman C. Waters Identification of interacting proteins with plasmodial cyclin dependent kinases using a bacterial two-hybrid system. 53rd Annual Meeting of American Society of Tropical Medicine and Hygiene November 7 - 11, 2004, Miami, Florida USA**

12) *SEMINARS OR LECTURES DELIVERED AT UNIVERSITIES AND/OR INSTITUTES* **Include dates, names and locations of seminars.**

13) *PROFESSIONAL AWARDS RECEIVED DURING TENURE*

14) *POST-TENURE POSITION TITLE*

**Professor in Molecular Biology**

15) *POST-TENURE ORGANIZATION* **Provide name and address of organization.**

**Biotechnology Research Center, Zhongshan University, Guangzhou, 510275, P.R.China**

16) *POST-TENURE POSITION STATUS / CATEGORY* **Please indicate only one.**

- ☐ Remain at Host Agency as Permanent Employee
- ☐ Remain at Host Agency as Contract/Temporary Employee
  **Abbreviate Host Laboratory/Center** _____
- ☐ Research Position at Another US Government Laboratory
- ☐ Administrative Position at US Government Laboratory
- ☐ Research Position at Foreign Government Laboratory
- ☐ Research/Teaching at US College/University
- ☒ Research/Teaching at Foreign College/University
- ☐ Research/Administration in Industry
- ☐ Research/Administration in Non-Profit Organization
- ☐ Postdoctoral Research
- ☐ Self Employed
- ☐ Other: **specify** _____

17) *APPRAISAL OF RESEARCJ ASSOCIATESHIP PROGRAM* **Please rate each of the following on a scale of 1 (poor) to 10 (excellent).**

**Your experience as a National Academies Research Associate in this federal Laboratory**

**9** Short-term value: development of knowledge, skills, and research productivity
**Comments:**

**9** Long-term value: how the National Academies Associateship award affected your career to date
**Comments:**
**I have learned a great deal about career developer and I am certain that the skills I have acquired will be of value throughout my career.**

**Administrative Support**

**10** Quality of the support you received from the federal Laboratory

**10** Quality of the support you received from the on-site and off-site Research Associateship Programs' representatives **(Leave blank, if not applicable – e.g., NIST)**
**Comments on both/either:**

18) *PLEASE PROVIDE ANY SUGGESTIONS FOR PROGRAM IMPROVEMENT.*

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**Research Associateship Programs**

# *FINAL REPORT*

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| **Cote** | **Christopher** | **K** |

| 2) *FORWARDING Address* (to which your tax statement will be mailed) | *FORWARDING Phone(s) and E-Mail* (if known) |
|---|---|
| Res. or Inst. **Chris Cote**<br>Street **1598 Dockside Drive**<br>City, State Zip **Frederick, MD 21701** | **Home Phone: 301-663-0060**<br>**Alt. Phone:**<br>**E-mail: christopher.cote1@amedd.army.mil** |

| 3) *Today's Date* | *Dates of Tenure* |
|---|---|
| **October 4, 2005** | from **April 28, 2002** to **October 28, 2005** |

| 4) *Agency* | *Laboratory or NASA Center* | *Division / Branch / Directorate* |
|---|---|---|
| **AMRMC** | **USAMRIID** | **Bacteriology Division** |

5) *Name of Research Associateship Programs Adviser*

**Susan L. Welkos**

6) *TITLE OF RESEARCH PROPOSAL*

**The roles of macrophages and neutrophils in the early host response to infection with Bacillus anthracis spores**

7) *SUMMARY OF RESEARCH DURING TENURE* **Itemize significant findings in concise form, utilizing key concepts/words.**

**1) Protective antigen (PA) was found to be associated with recently germinated spores, and the PA could not be attributed to spore purification procedures**

**2) Macrophages were shown to be important for host survival of anthrax; fewer macrophages meant shorter survival time while additional macrophages augmented survival times**

**3) Neither depleting or augmenting neutrophil populations significantly affected the outcome of a B. anthracis infection**

**4) Neutrophils seem to have an indirect role in the host immune response to B. anthracis spores, whereas macrophages have a direct role (ie. killing or transocation of spores)**

**5) Spore coat proteins and proteins associated with spore germination were evaluated as potential vaccine candidates**

8) *RESEARCH IN PROGRESS* **Describe in no more than 100 words.**

**Continue to examine host phagocyte-B. anthracis spore interactions in vivo**

9) *PUBLICATIONS AND PAPERS RESULTING FROM NATIONAL ACADEMIES ASSOCIATESHIP RESEARCH*

**Provide complete citations: author(s), title, full name of journal, volume number, page number(s), and year of publication.**

a) **Publications in peer-reviewed journals**

**Cote, C. K., C. Rossi, A. Kang, P. Morrow, J. S. Lee, and S. L. Welkos. The detection of protective antigen (PA) associated with spores of Bacillus anthracis and the effects of anti-PA antibodies on spore germination and macrophage interactions. Microbial Pathogenesis. 38(5-6): 209-225.**

**Bozue, J. A., N. Parthasarathy, L. R. Phillips, C. K. Cote, P. F. Fellows, I. Mendelson, A. Shafferman, and A. M. Friedlander. Construction of a rhamnose mutation in Bacillus anthracis affects adherence to macrophages but not virulence in guinea pigs. 2005. Microbial Pathogenesis. 38(1):1-12.**

**Cote, C. K., K. M. Rea, S. L. Norris, N. van Rooijen, and S. L. Welkos. The use of a model of in vivo macrophage depletion to study the role of macrophages during infection with Bacillus anthracis spores. 2004. Microbial Pathogenesis. 37(4):169-175.**

**Welkos, S. L., C. K. Cote, K. M. Rea, and P. H. Gibbs. A microtiter fluorometric assay to detect the germination of Bacillus anthracis spores and the germination inhibitory effects of antibodies. 2004. Journal of Microbiological Methods. 56(2): 253-265.**

b) **Books, book chapters, other publications**

Cote, C. K., D. J. Chabot, A. Scorpio, W. A. Day, T. E. Blank, S. L. Welkos, and J. A. Bozue. "Bacillus anthracis: Pathogenicity and Infection", in: Microbial Infection and Bioterrorism, eds. Burt Anderson, Herman Friedman and Mauro Bendinelli, Springer Publishers, New York, NY, In Press, 2005

c) Manuscripts in preparation, manuscripts submitted

Mallozzi, M., J. Bozue, R. Giorno, A. Slack, K. Moody, C. Cote, R. Wang, A. Friedlander, S. Welkos, and A. Driks. Characterization of a Bacillus anthracis spore coat gene specific to the B. cereus group. Manuscript submitted.

Cote, C. K., N. van Rooijen, and S. L. Welkos. The roles of macrophages and neutrophils in the early host response to Bacillus anthracis spores in a mouse model of infection. Manuscript IN PRESS INfection and Immunity.

Giorno, R., J. Bozue, C. Cote, M. Ryan, T. Wenzel, K. Moody, E. Lai, J. Maddock, R. Wang, A. Friedlander, S. Welkos, and A. Driks. Morphogenesis of the Bacillus anthracis spore coat. Manuscript sumitted.

10) *PATENT OR COPYRIGHT APPLICATIONS RESULTING FROM NATIONAL ACADEMIES ASSOCIATESHIP RESEARCH*
Provide titles, inventors, and dates of applications.

11) *PRESENTATIONS AT SCIENTIFIC MEETINGS OR CONFERENCES*
Provide complete references: author(s), title, abstract/proceeding citation, meeting name and location.

International

Cote, C. K. and S. L. Welkos. Studies on the roles of macrophages and neutrophils during infection with Bacillus anthracis spores. Presented as an oral presentation at the International Bacillus ACT Conference. Santa Fe, NM, September 2005.

Giorno, R., J. Bozue, C. Cote, K. Moody, S. Welkos, A. Friedlander, and A. Driks. Assembly of B. anthracis spore surface structures and their relationship to disease. International Bacillus ACT Conference. Santa Fe, NM, September 2005.

Giorno, R., J. Bozue, C. Cote, A. Friedlander, S. Welkos, and A. Driks. Morphogenesis of the Bacillus anthracis spore coat. International Bacillus anthracis spore. International Bacillus anthracis ACT Conference. Santa Fe, NM, September 2005.

Domestic

Cote, C. K. and S. L. Welkos. Studies on the role of neutrophils during infection with Bacillus anthracis. American Society for Microbiology, Annual meeting, Atlanta, GA, June 2005.

Cote, C. K. and S. L. Welkos. The possible roles of macrophages in host defense during infection with Bacillus anthracis. Scientific Conference on Chemical and Biological Defense Research. Hunt Valley, MD, November 2004.

Cote, C., Rossi, C., Kang, A., Morrow, P., and Welkos, S. The detection of spore-associated PA and the effects of anti-PA antibodies on Bacillus anthracis spore germination and macrophage interactions. Scientific Conference on Chemical and Biological Defense Research. Hunt Valley, MD, November 2004.

Cote, C. K., Nico van Rooijen, and S. L. Welkos. Studies on the role of macrophages during infection with Bacillus anthracis. American Society for Microbiology, Annual Meeting, New Orleans, LA, May 2004.

Welkos, S. L., C. K. Cote, C. A. Rossi, and A. Kang. The effects of human monoclonal anti-PA antibodies on the germination and macrophage interactions of Bacillus anthracis spores. American Society for Microbiology, Annual Meeting, New Orleans, LA, May 2004.

Cote, C. K., K. M. Rea, J. M. Bashaw, and S. L. Welkos. A sensitive fluorescence assay for the quantitative determination of spore germination inhibitory activity of antibodies to B. anthracis. AmericanSociety for Microbiology: Future Directions for Biodefense Research: Development of Countermeasures, Baltimore, MD, March 2003

12) *SEMINARS OR LECTURES DELIVERED AT UNIVERSITIES AND/OR INSTITUTES* Include dates, names and locations of seminars.

13) *PROFESSIONAL AWARDS RECEIVED DURING TENURE*

Outstanding poster presentations at the Fort Detrick Spring Research Festival (2003 and 2004)
USAMRIID Award of Safety Excellence, 2005

14) *POST-TENURE POSITION TITLE*

**Microbiologist**

15) *POST-TENURE ORGANIZATION* **Provide name and address of organization.**

**USAMRIID, Bacteriology Division**

16) *POST-TENURE POSITION STATUS / CATEGORY* **Please indicate only one.**

- ☐ Remain at Host Agency as Permanent Employee
- ☒ Remain at Host Agency as Contract/Temporary Employee
  **Abbreviate Host Laboratory/Center** **RIID**
- ☐ Research Position at Another US Government Laboratory
- ☐ Administrative Position at US Government Laboratory
- ☐ Research Position at Foreign Government Laboratory
- ☐ Research/Teaching at US College/University
- ☐ Research/Teaching at Foreign College/University
- ☐ Research/Administration in Industry
- ☐ Research/Administration in Non-Profit Organization
- ☐ Postdoctoral Research
- ☐ Self Employed
- ☐ Other: **specify** _____

17) *APPRAISAL OF RESEARCH ASSOCIATESHIP PROGRAM*
**On a scale of 1 – 10 (poor - excellent), please rate the following:**

SHORT TERM VALUE

10 Development of knowledge, skills, and research productivity
**Comments**

LONG TERM VALUE

10 How the National Academies Associateship award affected your career to date
**Comments**

LAB SUPPORT

10 Quality of support--equipment, funding, orientation, safety and health guidelines, etc.
**Comments**

ADVISER SUPPORT

10 Quality of mentoring from the Adviser
**Comments**

LPR SUPPORT

10 Quality administrative support from the LPR
**Comments**

NRC SUPPORT

10 Quality of administrative support from the NRC
**Comments**

18) *PLEASE PROVIDE ANY SUGGESTIONS FOR PROGRAM IMPROVEMENT.*

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# *FINAL REPORT*

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| **Res. or Inst. Home**<br>**Street 7 Hana Robina St**<br>**City, State Zip Tel-Aviv Israel, 69372** | **Home Phone: 972-3-6449253**<br>**Alt. Phone:**<br>**E-mail: haimleader@hotmail.com** |


| 3) *Today's Date* | *Dates of Tenure* |
|---|---|
| **October 15, 2005** | from **November 4, 2002** to **November 2, 2005** |

| 4) *Agency* | *Laboratory or NASA Center* | *Division / Branch / Directorate* |
|---|---|---|
| **AMRMC** | **WRAIR** | **Biochemistry** |

5) *Name of Research Associateship Programs Adviser*

**Richrd K. Gordon**

6) *TITLE OF RESEARCH PROPOSAL*

**Purification of Proteines with Macroaffinity Ligands Sponges ( Polyuretane immpbilized Ligands)**

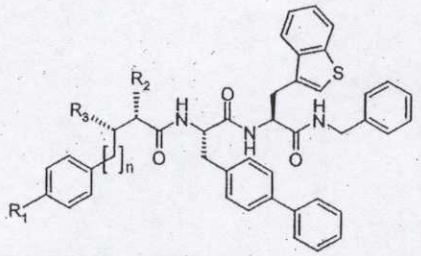
7) *SUMMARY OF RESEARCH DURING TENURE* **Itemize significant findings in concise form, utilizing key concepts/words.**


1) The first part of the project focused on the design and the synthesis of affinity ligands-procainamide analoges for coupling to a polyurethane prepolymer (toluene diisocyanate). These ligands consist of 3 parts: (a) terminal free $NH_2$ group to which coupling to the sponge prepolymer would occur: (b) hydrocarbon chain from 6 to 12 carbon length, to permit sufficient distance between the sponge and the active ligand end to spacially interact with the ChE active site and (c) an affinity ligand molecule (like procainamide in the case of ChEs) at the other end of the molecule.

2) Five ψ-amino acid-procainamide ligands have been synthesized and were characterized for purity and structural elucidation by TLC and $^{1}H$ and $^{13}C$ NMR spectroscopy.

3) These spacer-ligand molecules were coupled through their free amino group to the polyurethane-prepolymer, which produced a cross-linked polyurethane matrix containing the affinity ligands. The data obtained indicates that the optimal hydrocarbon chains for the affinity ligand procainamide polyurethane prepolymer is $C_7$ to $C_{11}$ and the $C_{10}$ and $C_{11}$ were the most effective ligands to bind the ChEs. Thus we have demonstrated the importance of chain length for high binding capacity of AChE.

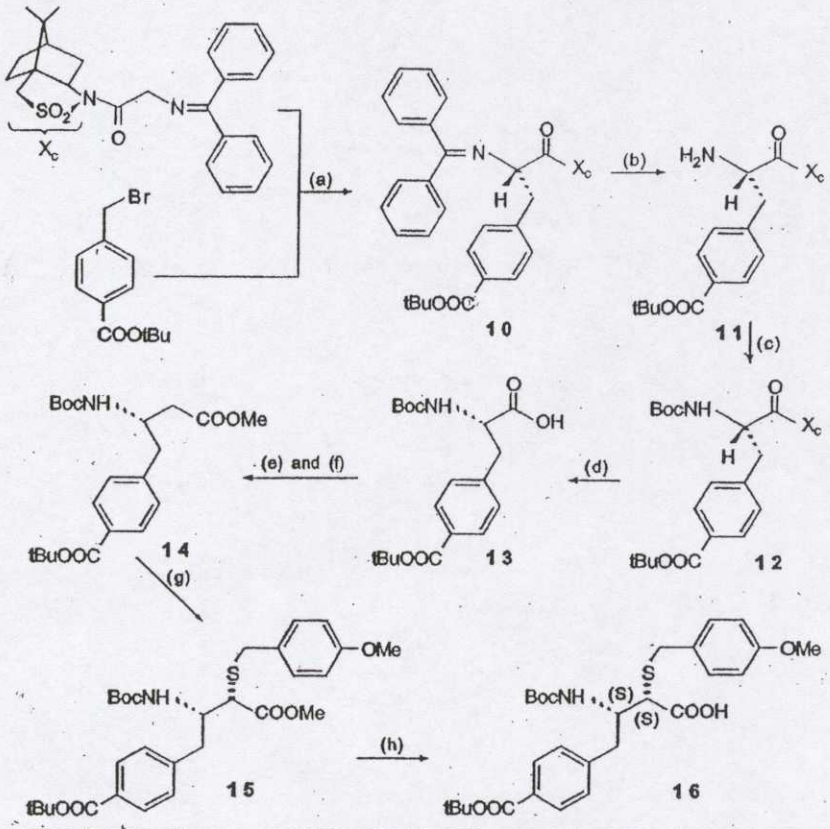
4) To extend these observations I proposed to demonstrate the suitability of the affinity sponge for another protein. We set out to replace the procainamide with a pseudotripeptide, a selective and very potent botulinum toxin inhibitor (**1**). ( see structure below):

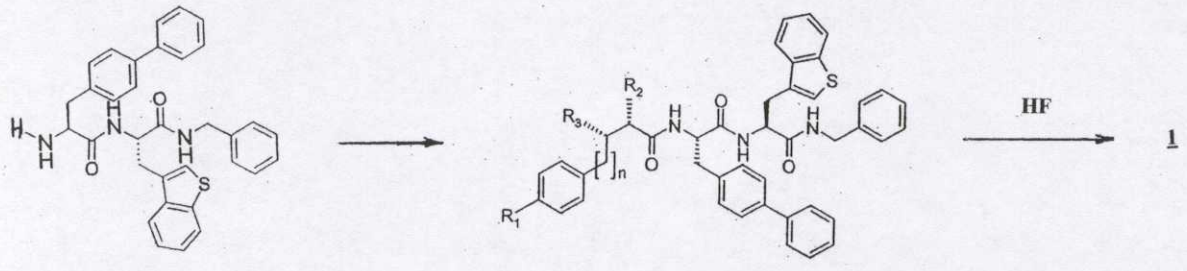

| Compound | $R_1$ | $R_2$[a] | $R_3$ | $n$ | $K_i \pm$ SEM[b] (nM) |
|---|---|---|---|---|---|
| 1 | –COOH | –SH | $-NH_2$ | 1 | 20 ± 2 |

5) The synthesis of the pseudotripeptide is very complex one and was based on four major steps; (a) synthesis of the key intermediate synton **16**: (b) synthesis of the pseudodipeptide **17**: (c) coupling of the synton **16** with the dipeptide **17** to get the protected pseudotripeptide**18:** (d) deprotecting **18** using liquid HF to get the final unprotected pseudotripeptide (see scheme and structures below):

Synthesis of Synthon **16**




(a) nBuLi 2.5 M/hexane, THF, HMPA; (b) citric acid 10%, THF; (c) $NEt_3$, $(Boc)_2O$, DMF; (d) LiOH, LiBr, $nBu_4NBr$, acetonitrile; (e) iBuOCOCl, NMM, THF; (f) diazomethane followed by silver benzoate, $NEt_3$, methanol; (g) nBuLi 1.6 M/hexane, HMDS, THF then HMPA, 1-(4-methoxybenzyldisulfanyl)-2,4-dinitrobenzene; (h) bis(tributyltin) oxide, acetonitrile.




$R_1$=COOtBu $R_2$ = -S-(4 MeO)Bn $R_3$=NHBoc n=1

8) *RESEARCH IN PROGRESS* **Describe in no more than 100 words.**

Unfortunately the hydrogen fluoride (HF) deprotection step turned to be a very "unclean" reaction, leading to several side reaction products. We are facing some problems in the separation process in order to isolate and to purify the tripeptide. It seems that the only way to do it is by using semi preparative HPLC system combined with a LC/MS system, by which we will be able to validate the identity of the desired tripeptide. We are now in the phase of developing the appropriate analytical procedures by which we will be able to complete the goal of the project.

9) *PUBLICATIONS AND PAPERS RESULTING FROM NATIONAL ACADEMIES ASSOCIATESHIP RESEARCH*
**Provide complete citations: author(s), title, full name of journal, volume number, page number(s), and year of publication.**

**a) Publications in peer-reviewed journals**

**b) Books, book chapters, other publications**

**c) Manuscripts in preparation, manuscripts submitted**

10) *PATENT OR COPYRIGHT APPLICATIONS RESULTING FROM NATIONAL ACADEMIES ASSOCIATESHIP RESEARCH*
**Provide titles, inventors, and dates of applications.**

11) *PRESENTATIONS AT SCIENTIFIC MEETINGS OR CONFERENCES*
**Provide complete references: author(s), title, abstract/proceeding citation, meeting name and location.**

**International**

**Domestic**

12) *SEMINARS OR LECTURES DELIVERED AT UNIVERSITIES AND/OR INSTITUTES* **Include dates, names and locations of seminars.**

13) *PROFESSIONAL AWARDS RECEIVED DURING TENURE*

14) *POST-TENURE POSITION TITLE*

15) *POST-TENURE ORGANIZATION* **Provide name and address of organization.**

16) *POST-TENURE POSITION STATUS / CATEGORY* **Please indicate only one.**

- ☐ Remain at Host Agency as Permanent Employee
- ☐ Remain at Host Agency as Contract/Temporary Employee
  **Abbreviate Host Laboratory/Center** _____
- ☐ Research Position at Another US Government Laboratory
- ☐ Administrative Position at US Government Laboratory
- ☐ Research Position at Foreign Government Laboratory
- ☐ Research/Teaching at US College/University
- ☐ Research/Teaching at Foreign College/University
- ☐ Research/Administration in Industry
- ☐ Research/Administration in Non-Profit Organization
- ☐ Postdoctoral Research
- ☒ Self Employed
- ☒ Other: **specify** **consultant**

17) *APPRAISAL OF RESEARCH ASSOCIATESHIP PROGRAM*

**On a scale of 1 – 10 (poor - excellent), please rate the following:**

SHORT TERM VALUE

9 Development of knowledge, skills, and research productivity
**Comments**

LONG TERM VALUE

8 How the National Academies Associateship award affected your career to date
**Comments**

LAB SUPPORT

10 Quality of support--equipment, funding, orientation, safety and health guidelines, etc.
**Comments**

ADVISER SUPPORT

10 Quality of mentoring from the Adviser
**Comments**

LPR SUPPORT

10 Quality administrative support from the LPR
**Comments**

NRC SUPPORT

10 Quality of administrative support from the NRC
**Comments**

18) *PLEASE PROVIDE ANY SUGGESTIONS FOR PROGRAM IMPROVEMENT*

**The program is a very successful idea. In order to improve it one should think how to solve and overcome some of the administrative visa (J-1) barriers, although I'm aware of the secutity issues.**

THE NATIONAL ACADEMIES
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**Research Associateship Programs**

# *FINAL REPORT*

Print Layout View

**Return this form directly to the National Academies as an E-mail attachment, or print out and mail or fax.**

| 1) *Associate Last or Family Name* | *First Name* | *M.I.* |
|---|---|---|
| **Minsavage** | **Gary** | **D** |

| 2) *FORWARDING Address* (to which your tax statement will be mailed) | *FORWARDING Phone(s) and E-Mail* (if known) |
|---|---|
| Res. or Inst.<br>Street **360 Taylor Ave. APT# 13-D**<br>City, State Zip **Easton, PA 18042** | **Home Phone:**<br>**Alt. Phone: 585-233-5753 (cell)**<br>**E-mail: minsog@hotmail.com** |

| 3) *Today's Date* | *Dates of Tenure* |
|---|---|
| **November 1, 2005** | from **September 1, 2004** to **November 20, 2005** |

| 4) *Agency* | *Laboratory or NASA Center* | *Division / Branch / Directorate* |
|---|---|---|
| **AMRMC** | **Dillman** | **Research Division/Cell and Mol Branch** |

5) *Name of Research Associateship Programs Adviser*

**Dr. James F. Dillman, III**

6) *TITLE OF RESEARCH PROPOSAL*

**Proteomic analysis of phosphorylated proteins following exposure to organophosphorus nerve agents**

7) *SUMMARY OF RESEARCH DURING TENURE* **Itemize significant findings in concise form, utilizing key concepts/words.**

1) **Proteomics approaches revealed soman-induced tyrosine phosphorylation changes within 30 min of expsoure**

2) **Proteomics approaches revealed HI-6/atropine-induced tyrosine phosphorylation changes within 30 min after exposure**

3) **Bifunctional alkylating agents induce p53 and nonclassical nuclear factor-kappa B (NF-kB) signaling**

4) **Bifunctional alkylating agent-induced signaling is inhibited by caffeic acid phenethyl ester**

5) **A common mechanism of therapeutic action against bifunctional alkylating agent may be mediated through antoxidant/electrophilic response element signaling activated by Nrf2**

6) **TNFalpha family aptamers inhibit TNFalpha-mediated NF-kB activity**

8) *RESEARCH IN PROGRESS* **Describe in no more than 100 words.**

**Maldi-TOF/TOF mass spectrometry will be utilized to identify soman- and HI-6/atropine-induced tyrosine phosphorylated proteins. This will contribute to identification of critical targets for development of therapeutics for OP-induced toxic responses. Molecular mechanisms of bifunctional alkylating agent- and therapeutic-induced p53, NF-kB and Nrf2 responses (utilizing novel reporter gene systems) will be further delineated to identify therapeutic targets. Aptamers will be further examined for there utility in development as medical countermeasures against chemical warfare agents and for their potential to be developed for toxicant-related "protein signature chips."**

9) *PUBLICATIONS AND PAPERS RESULTING FROM NATIONAL ACADEMIES ASSOCIATESHIP RESEARCH*

**Provide complete citations: author(s), title, full name of journal, volume number, page number(s), and year of publication.**

**a) Publications in peer-reviewed journals**

**Minsavage, G.D. and Dillman, J.F. III (2005) Altered signal transduction in human keratinocytes following exposure to bi-functional alkylating agents. Tox. Sci. 84(S-1):38.**

**b) Books, book chapters, other publications**

**c) Manuscripts in preparation, manuscripts submitted**

**Minsavage, G.D. and Dillman, J.F. III (2005) Bifunctional alkylating agent-induced p53 and nonclassical nuclear factor-kappa B (NF-kB) responses are inhibited by caffeic acid phenethyl ester (CAPE) in human keratinocytes (submitted)**

**Minsavage, G.D., Ruff, A, Sylvester, A and Dillman, J.F. III (2005) Development of an ocular reporter gene system for chemoprotectant screening (in preparation)**

**Comments**

**Excellent research environment (mentor, funding and equipement) that allowed tremendous productivity**

LONG TERM VALUE

10 How the National Academies Associateship award affected your career to date

**Comments**

**Acquired contacts and non-research skills that have helped my career greatly progress**

LAB SUPPORT

10 Quality of support--equipment, funding, orientation, safety and health guidelines, etc.

**Comments**

**Outstanding support in the Dillman labs at USAMRICD**

ADVISER SUPPORT

10 Quality of mentoring from the Adviser

**Comments**

**Dr. Dillman has provided the highest quality of mentorship—allowing me to work independently while offering advice and help when requested or needed**

LPR SUPPORT

9 Quality administrative support from the LPR

**Comments**

**The administrative support from the LPR was of high quality (relatively little help was needed throughout my tenure)**

NRC SUPPORT

10 Quality of administrative support from the NRC

**Comments**

**The administrative support from everyone at the NRC was outstanding. Prompt and thorough. Thank you very much!!**

18) *PLEASE PROVIDE ANY SUGGESTIONS FOR PROGRAM IMPROVEMENT.*

**Based on discussions with current graduate students, I would suggest that the NRC and each individual institution consider a stipend increase to match that offered to postdocs that work in academia. The stipend for an NRSA has risen over the past few years relatively dramatically. A similar increase for NRC stipends may maintain one of the competitive advantages of pursuing a NRC position.**

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**Research Associateship Programs**

# *FINAL REPORT*

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| 1) *Associate Last or Family Name* | *First Name* | *M.I.* |
|---|---|---|
| **Nephew** | **Benjamin** | **C.** |

| 2) *FORWARDING Address* (to which your tax statement will be mailed) | *FORWARDING Phone(s) and E-Mail* (if known) |
|---|---|
| Res. or Inst.<br>Street **9 Putnam Rd. #8**<br>City, State Zip **Foxboro, MA 02035** | Home Phone: **508-698-9636**<br>Alt. Phone:<br>E-mail: **bcnephew@aol.com** |

| 3) *Today's Date* | *Dates of Tenure* |
|---|---|
| **August 22, 2005** | from **October 15, 2004** to **August 26, 2005** |

| 4) *Agency* | *Laboratory or NASA Center* | *Division / Branch / Directorate* |
|---|---|---|
| **AMRMC** | **USARIEM** | **Thermal and Mountain Medicine** |

5) *Name of Research Associateship Programs Adviser*

**Lisa R. Leon, Ph.D.**

6) *TITLE OF RESEARCH PROPOSAL*

**Mechanims of Heat Stress Recovery in Mice**

7) *SUMMARY OF RESEARCH DURING TENURE* **Itemize significant findings in concise form, utilizing key concepts/words.**

**1) Post-surgical growth in transient receptor potential vanilloid 1 (TRPV1) knockout mice does not differ from C57BL/6J wildtype mice.**

**2) TRPV1 receptor modulates Tc and activity following surgery.**

**3) TRPV1 mediates thermoregulatory responses to acute stressors such as cage change and cage switch.**

**4) TRPV1 mice accumulate a greater thermal load during heating than C57BL/6J wildtype mice due to an increase in ascending thermal area.**

**5) Despite accumulating a greater thermal load, there was no increased mortality in TRPV1 knockout mice compared to C57BL/6J wildtype controls.**

8) *RESEARCH IN PROGRESS* **Describe in no more than 100 words.**

**The animal facitlity was shut down for construction in May following the TRPV1 knockout mice studies, so further animal studies were not possible.**

9) *PUBLICATIONS AND PAPERS RESULTING FROM NATIONAL ACADEMIES ASSOCIATESHIP RESEARCH*
**Provide complete citations: author(s), title, full name of journal, volume number, page number(s), and year of publication.**

**a) Publications in peer-reviewed journals**

**b) Books, book chapters, other publications**

**c) Manuscripts in preparation, manuscripts submitted**

**Enhanced Thermoregulatory Response to Heat Exposure in TRPV1 Knockout Mice**

**B.C. Nephew and L.R. Leon**

10) *PATENT OR COPYRIGHT APPLICATIONS RESULTING FROM NATIONAL ACADEMIES ASSOCIATESHIP RESEARCH*
**Provide titles, inventors, and dates of applications.**

11) *PRESENTATIONS AT SCIENTIFIC MEETINGS OR CONFERENCES*

**Provide complete references: author(s), title, abstract/proceeding citation, meeting name and location.**

**International**

**Domestic**

**Surgical recovery and circadian temperature and activity rhythms of transient receptor potential vanilloid 1 (TRPV 1) knockout mice**
**Nephew, B.C., and Leon, L.R.**

**Experimental Biology 2005, San.Diego**

12) *SEMINARS OR LECTURES DELIVERED AT UNIVERSITIES AND/OR INSTITUTES* **Include dates, names and locations of seminars.**

13) *PROFESSIONAL AWARDS RECEIVED DURING TENURE*

14) *POST-TENURE POSITION TITLE*

**Assistant Professor of Biology, Regis College**

15) *POST-TENURE ORGANIZATION* **Provide name and address of organization.**

**Regis College, Weston, MA 02493**

16) *POST-TENURE POSITION STATUS / CATEGORY* **Please indicate only one.**

- ☐ Remain at Host Agency as Permanent Employee
- ☐ Remain at Host Agency as Contract/Temporary Employee
  **Abbreviate Host Laboratory/Center** _____
- ☐ Research Position at Another US Government Laboratory
- ☐ Administrative Position at US Government Laboratory
- ☐ Research Position at Foreign Government Laboratory
- ☒ Research/Teaching at US College/University
- ☐ Research/Teaching at Foreign College/University
- ☐ Research/Administration in Industry
- ☐ Research/Administration in Non-Profit Organization
- ☐ Postdoctoral Research
- ☐ Self Employed
- ☐ Other: **specify** _____

17) *APPRAISAL OF RESEARCH ASSOCIATESHIP PROGRAM*

**On a scale of 1 – 10 (poor - excellent), please rate the following:**

SHORT TERM VALUE

10 Development of knowledge, skills, and research productivity
**Comments**

LONG TERM VALUE

9 How the National Academies Associateship award affected your career to date
**Comments**

LAB SUPPORT

10 Quality of support--equipment, funding, orientation, safety and health guidelines, etc.
**Comments**

ADVISER SUPPORT

9 Quality of mentoring from the Adviser
**Comments**

LPR SUPPORT

9 Quality administrative support from the LPR
**Comments**

NRC SUPPORT

9 Quality of administrative support from the NRC
**Comments**

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**Research Associateship Programs**

# *FINAL REPORT*

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| 1) *Associate Last or Family Name* | *First Name* | *M.I.* |
|---|---|---|
| **Shurtleff** | **Amy** | **C** |

| 2) *FORWARDING Address* (for tax statement / final stipend check ) | *FORWARDING Phone(s) and E-Mail* (if known) |
|---|---|
| **622 W. Wedgewood Way, Manteca, CA 95336** | **Home phone:**<br>**Alt. phone: (240) 409-6078**<br>**E-mail: amyshurtleff@yahoo.com** |

| 3) *Today's Date* | *Dates of Tenure* |
|---|---|
| **May 25, 2005** | **from May 21, 2002 to May 20, 2005** |

| 4) *Agency* | *Laboratory* | *or* | *NASA Center* | *Division / Branch / Directorate* |
|---|---|---|---|---|
| **AMRMC** | **USAMRIID** | | | **Virology** |

5) *NAME OF RESEARCH ADVISER*
**Mary C. Guttieri, Ph.D.**

6) *TITLE OF RESEARCH PROPOSAL*

**Development of human monoclonal antibody therapy to Lassa Fever**

7) *SUMMARY OF RESEARCH DURING TENURE* **Itemize significant findings in concise form, utilizing key concepts/words.**

1) **Developed a naked DNA vaccine expressing Lassa virus glycoproteins**
2) **Tested protective efficacy of DNA vaccine against Lassa fever in guinea pig infection model using gene gun vaccination**
3) **Developed an infection model for Lassa virus in mice**
4) **Collaborated with Viropharma, Inc. and SIGA Technologies to test novel compounds with effective antiviral properties**
5) **Investigated the role of serum complement activation in Lassa virus infection**

8) *RESEARCH IN PROGRESS* **Describe in no more than 100 words.**

**The research projects sponsored by this fellowship have been devoted to the development and testing of potential vaccines, anti-viral drugs and/or anti-viral therapeutics against Lassa virus. A DNA vaccine has been developed and tested in guinea pigs and mice infected with Lassa virus, and a VSV vectored vaccine was also tested in non-human primates. Anti-viral compounds and peptides produced by some collaborators were tested for their ability to inactivate Lassa virus in vitro, and potentially effective drug candidates will be further tested in the guinea pig model for Lassa virus infection.**

9) *PUBLICATIONS AND PAPERS RESULTING FROM THE NATIONAL ACADEMIES ASSOCIATESHIP RESEARCH*
**Provide complete citations: author(s), title, full name of journal, volume number, page number(s), and year of publication.**

a) **Publications in peer-reviewed journals**

**K. M. Daddario, E. A. Fritz, J. B. Geisbert, T. W. Geisbert, M. C. Guttieri, L. E. Hensley, P.B. Jahrling, B. R. Mothe, A.C. Shurtleff. Development of a new rapid vaccine for the prevention of Lassa fever in cynomolgus monkeys. Accepted PLOS Medicine April 2005.**

b) Books, book chapters, other publications

K. Spik, A.C. Shurtleff, A. McElroy, M.C. Guttieri, J. W. Hooper, C. S. Schmaljohn. Immunogenicity of combination DNA vaccines for Rift Valley fever virus, tick-borne encephalitis virus, Hantaan virus, and Crimean Congo hemorrhagic fever virus. Submitted January 2005 to Vaccine.

Shurtleff, A.C. 2004. TMC-114. Current Opinion in Investigational Drugs. 5(8):879-886.

Shurtleff, A.C. 2004. Bioterrorism and emerging infectious disease - antimicrobials, therapeutics and immune-modulators. SARS coronavirus. IDrugs. 7(2):91- 95.

c) Manuscripts in preparation, manuscripts submitted

Shurtleff, A.C. et al. Production and evaluation of a DNA vaccine against Lassa virus in a guinea pig infection model. In Preparation.

Shurtleff, A.C. et al. Development of a murine infection model for Lassa fever, and efficacy of a DNA vaccine against Lassa virus glycoproteins. In Preparation.

10 *PATENT OR COPYRIGHT APPLICATIONS RESULTING FROM THE NATIONAL ACADEMIES ASSOCIATESHIP RESEARCH*
Provide titles, inventors, and dates of applications.

11) *PRESENTATIONS AT SCIENTIFIC MEETINGS OR CONFERENCES*
Provide complete references: author(s), title, abstract/proceeding citation, meeting name and location.

International

Shurtleff, A.C., Geisbert, J., Geisbert, T., Schmaljohn, C.S., Guttieri, M.C. 2003. Production and evaluation of a DNA vaccine against Lassa virus in a guinea pig infection model. Poster Presentation, DNA Vaccines 2004, Monte Carlo, Monaco.

Shurtleff, A.C., Geisbert, J., Geisbert, T., Schmaljohn, C.S., Guttieri, M.C. 2003. Production and evaluation of a DNA vaccine against Lassa virus in a guinea pig infection model. Poster Presentation, The 12th International Conference on Negative Strand Viruses, Pisa, Italy

Domestic

**Shurtleff, A.C., Ferro, P.J., Geisbert, J., Geisbert, T., Schmaljohn, C.S., Guttieri, M.C. 2004. Production and evaluation of a DNA vaccine against Lassa virus in a guinea pig infection model. Oral Presentation. Keystone Symposium: Bioterrorism and Emerging Infectious Diseases: Antimicrobials, Therapeutics and Immune-Modulators, Keystone, Colorado**

12) *SEMINARS OR LECTURES DELIVERED AT UNIVERSITIES AND/OR INSTITUTES* **Include dates, names and locations of seminars.**

**June 4, 2004 Approaches for Controlling Lassa Virus Infection: Analysis of a DNA vaccine and steps towards Immunotherapy. Given at the La Jolla Institute for Allergy and Immunology, La Jolla, CA.**

**April 8, 2005 Approaches for Controlling Lassa Virus Infection: Production and Evaluation of a DNA vaccine. Given at SRI International, Inc. Menlo Park, CA.**

13) *PROFESSIONAL AWARDS RECEIVED DURING TENURE*

**Threat Assessment Project Funded at USAMRIID (9/03-9/04)**
**Granted by the Biothreat Assessment Support Center (BASC) at the National Biodefense Analysis and Countermeasures**

14) *POST-TENURE POSITION TITLE*

**Molecular Biologist, Vaccine Development**

15) *POST-TENURE ORGANIZATION* **Provide name and city of organization.**

**SRI International, Inc.**
**Menlo Park, CA**

16) *POST-TENURE POSITION STATUS / CATEGORY* **Please indicate only one.**

- [ ] Remain at Host Agency as Permanent Employee
- [ ] Remain at Host Agency as Contract/Temporary Employee
  Abbreviate Host Laboratory/Center_____
- [ ] Research Position at Another US Government Laboratory
- [ ] Administrative Position at US Government Laboratory
- [ ] Research Position at Foreign Government Laboratory
- [ ] Research/Teaching at US College/University
- [ ] Research/Teaching at Foreign College/University
- [ ] Research/Administration in Industry
- [x] Research/Admin in Non-Profit Organization
- [ ] Postdoctoral Research
- [ ] Self Employed
- [ ] Other: specify

17) *APPRAISAL OF THE ASSOCIATESHIP PROGRAM* **Please rate each of the following**

**Your experience as a National Academies Research Associate in this federal Laboratory** 1 (poor) to 10 (excellent)

10 Short-term value: development of knowledge, skills, and research productivity
**Comments:**

**The research opportunities at USAMRIID were very productive and gave me room to develop collaborations.**

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**Research Associateship Programs**

# *FINAL REPORT*

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| 1) *Associate Last or Family Name* | *First Name* | *M.I.* |
|---|---|---|
| **Swenson** | **Dana** | **L** |

| 2) *FORWARDING Address* (to which your tax statement will be mailed) | *FORWARDING Phone(s) and E-Mail* (if known) |
|---|---|
| Res. or Inst.<br>Street **8105 Stone Ridge Dr**<br>City, State Zip **Frederick, MD 21702** | **Home Phone: 520-260-8393**<br>**Alt. Phone: 301-619-5112**<br>**E-mail: dana.swenson@amedd.army.mil** |

| 3) *Today's Date* | *Dates of Tenure* |
|---|---|
| **November 12, 2005** | from **April 1, 2002** to **November 12, 2005** |

| 4) *Agency* | *Laboratory or NASA Center* | *Division / Branch / Directorate* |
|---|---|---|
| **AMRMC** | **USAMRIID** | |

5) *Name of Research Associateship Programs Adviser*

**Sina Bavari**

6) *TITLE OF RESEARCH PROPOSAL*

**Study of vaccines and therapeutics for filoviral infections**

7) *SUMMARY OF RESEARCH DURING TENURE* **Itemize significant findings in concise form, utilizing key concepts/words.**

**1) Investigated the ability of virus-like particles (VLPs) to be used as vaccines for filoviral infections. Developed Ebola and Marburg VLP vaccines and showed efficacy in rodents and nonhuman primates.**

**2) Evaluated antisense compounds as a therapeutic for filoviral infections in vitro and in vivo. Showed efficacy of antisense compounds in rodents and nonhuman primates.**

3)

4)

5)

8) *RESEARCH IN PROGRESS* **Describe in no more than 100 words.**

**Studies are being performed with mixtures of eVLP and mVLP as a pan-filovirus vaccine in non-human primates. We will assess the ability of this vaccine to induce immune responses and to protect against diverse filovirus challenges of EBOV and MARV in the nonhuman primate model. Studies are also currently underway in mice and guinea pigs to assess and optimize the route and dose of antisense compounds to prevent or treat EBOV and MARV infections. Future studies will include assessing the most promising candidates in non-human primates.**

9) *PUBLICATIONS AND PAPERS RESULTING FROM NATIONAL ACADEMIES ASSOCIATESHIP RESEARCH*

**Provide complete citations: author(s), title, full name of journal, volume number, page number(s), and year of publication.**

a) **Publications in peer-reviewed journals**

**Induction of humoral and CD8+ T cell responses are required for protection from lethal Ebola virus infection. Kelly L. Warfield, Gene Olinger, Emily M. Deal, Michael Bailey, Diane L. Negley, Dana L. Swenson, Mary Kate Hart, and Sina Bavari. 2005. J. Immunol. 175:1184-1191.**

**Virus-like particles exhibit potential as a pan-filovirus vaccine for both Ebola and Marburg viral infections. Dana L. Swenson, Kelly L. Warfield, Diane L. Negley, Alan Schmaljohn, M. Javad Aman, and Sina Bavari. 2005. Vaccine. 23:3033-3042.**

**Analysis of Ebola virus and VLP release using an immunocapture assay. George Kallstrom, Kelly L. Warfield, Dana L. Swenson, Shannon Mort, Rekha Panchal, Gordon Ruthel, Sina Bavari, and M. Javad Aman. 2005. J. Virol Methods. 127: 1-9.**

**Role of NK cells in innate protection against lethal Ebola virus infection. Kelly L. Warfield, Jeremy G. Perkins, Dana L. Swenson, Emily M. Deal, Catharine M. Bosio, M. Javad Aman, Wayne M. Yokoyama, Howard A. Young, and Sina Bavari. 2004. J Exp Med. 200(2): 1-12.**

Marburg virus-like particles protect guinea pigs from lethal Marburg virus infection. Kelly L. Warfield, Dana L. Swenson, Diane L. Negley, Alan Schmaljohn, M. Javad Aman, and Sina Bavari. 2004. Vaccine. 22:3495-3502.

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b) Books, book chapters, other publications

Invited reviews:

Filovirus-like particles as vaccines and discovery tools. Kelly L. Warfield, Dana L. Swenson, Gretchen Demmin, and Sina Bavari. 2005. Expert Reviews of Vaccines. 4(3): 429-440.

Book chapters:

Viral hemorrhagic fevers. Kelly L. Warfield, Nancy K. Jaax, Emily M. Deal, Dana L. Swenson, Tom Larsen, and Sina Bavari. 2005. In Biodefense: Research Methodology and Animal Models. 227-258. CRC Press.

c) Manuscripts in preparation, manuscripts submitted

Gene-Specific Therapeutic Against Ebola Virus Based On Antisense Phosphorodiamidate Morpholino Oligomers. Kelly L. Warfield, Dana L. Swenson, Andrew D. Kroeker, Gene Olinger, Donald K. Nichols, William D. Pratt, David A. Stein, Patrick L. Iversen, and Sina Bavari. 2005. Submitted.

VP35 knockdown inhibits Ebola virus amplification and protects against lethal infection. Sven Enterlein*, Kelly L. Warfield*, David A. Stein, Dana L. Swenson, Patrick L. Iversen*, Sina Bavari, and Elke Mühlberger. 2005. Submitted.

Prior immunity to Marburg virus (Musoke strain) does not induce heterologous protection against Ebola virus infections in nonhuman primates. Warfield, K.L., Swenson, D.L., Negley, D.L., Hevey, M.C., Schmaljohn, A.L., and Bavari, S. Manuscript in preparation.

Ebola virus-like particles directly stimulate human NK cells and induce viral clearance. Fuller, C.L., Warfield, K.L., Bosio, C.M., Swenson, D.L., Perkins, J.G., Aman, M.J., Young, H.A., and Bavari, S. Manuscript in preparation.

10) *PATENT OR COPYRIGHT APPLICATIONS RESULTING FROM NATIONAL ACADEMIES ASSOCIATESHIP RESEARCH*

Provide titles, inventors, and dates of applications.

Generation of virus-like particles and use as panfilovirus vaccine. Filed April 13, 2005. U.S. Application No. 11/105,031. Sina Bavari, M. Javad Aman, Alan L. Schmaljohn, Kelly L. Warfield, and Dana L. Swenson.

11) *PRESENTATIONS AT SCIENTIFIC MEETINGS OR CONFERENCES*

Provide complete references: author(s), title, abstract/proceeding citation, meeting name and location.

International

Ebola virus-like particles directly stimulate human NK cells and induce viral clearance. Claudette L. Fuller, Catharine M. Bosio, Kelly L. Warfield, Dana L. Swenson, Jeremy G. Perkins, M. Javad Aman, Howard A. Young, and Sina Bavari. 8th Annual meeting of the society for Natural Immunity and 20th International Natural Killer Cell Workshop. April 2004. Noordwijkerhout, The Netherlands.

Development of a Phosphorodiamidate Morpholino Oligomer Antisense to Ebola Zaire. Kelly Warfield, Dana Swenson, David Stein, Andrew Kroeker, Patrick Iversen, Sina Bavari. International Congress on Antiviral Research. March 2005.

Domestic

Ebola and Marburg virus-like particles: Important implications for development of therapeutics and vaccination strategies. Kelly Warfield, Catharine M. Bosio, Robert Hogan, Dana Swenson, Gordon Ruthel, Diane Negley, Connie Schmaljohn, Michael Hevey, Mary Kate Hart, Alan Schmaljohn, M. Javad Aman, Sina Bavari. Joint Services Conference on Biological and Chemical Defense. November 2002. Hunt Valley, Maryland.

Generation of Marburg Virus-Like Particles by Co-expression of Glycoprotein and Matrix Protein. Dana L. Swenson, Kelly L. Warfield, Kathleen Kuehl, Thomas Larson, Michael Hevey, Alan Schmaljohn, Sina Bavari, and M. Javad Aman. ASM Biodefense Meeting. March 2003. Baltimore, Maryland.

**Filovirus-like particles as vaccines and discovery tools. Kelly L. Warfield, Dana L. Swenson, Brian Moore, Diane Negley, Gretchen Demmin, Connie Schmaljohn, Alan Schmaljohn, M. Javad Aman, and Sina Bavari. Scientific conference on chemical and biodefense research. November 2004.**

**Role of natural killer cells in innate protection against lethal Ebola virus infection. Kelly L. Warfield, Jeremy G. Perkins, Dana L. Swenson, Emily M. Deal, Catharine M. Bosio, M. Javad Aman, Wayne M. Yokoyama, Howard A. Young, and Sina Bavari. Keystone Symposia: Innate Immunity to Pathogens. January 2005.**

**Filovirus-like particles as vaccines and discovery tools. Kelly L. Warfield, Dana L. Swenson, Brian Moore, Diane Negley, Gretchen Demmin, Connie Schmaljohn, Alan Schmaljohn, M. Javad Aman, and Sina Bavari. American Society of Microbiology Biodefense Meeting. March 2005.**

**Filovirus-like particles as vaccines and discovery tools. Kelly L. Warfield, Dana L. Swenson, Diane Negley, M. Javad Aman, and Sina Bavari. Fort Detrick Symposium on Biodefense. April 2005.**

**Filovirus-like particles as vaccines and discovery tools. Kelly L. Warfield, Dana L. Swenson, Diane Negley, M. Javad Aman, and Sina Bavari. Spring Research Festival. May 2005.**

12) *SEMINARS OR LECTURES DELIVERED AT UNIVERSITIES AND/OR INSTITUTES* **Include dates, names and locations of seminars.**

13) *PROFESSIONAL AWARDS RECEIVED DURING TENURE*

14) *POST-TENURE POSITION TITLE*

**Microbiologist**

15) *POST-TENURE ORGANIZATION* **Provide name and address of organization.**

**USAMRIID, 1425 Porter Street, Fort Detrick, MD 21702**

16) *POST-TENURE POSITION STATUS / CATEGORY* **Please indicate only one.**

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- ☐ Research/Administration in Industry
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17) *APPRAISAL OF RESEARCH ASSOCIATESHIP PROGRAM*
**On a scale of 1 – 10 (poor - excellent), please rate the following:**

SHORT TERM VALUE

10 Development of knowledge, skills, and research productivity
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LONG TERM VALUE

10 How the National Academies Associateship award affected your career to date
**Comments**

LAB SUPPORT

10 Quality of support--equipment, funding, orientation, safety and health guidelines, etc.
**Comments**
**The infrastructure available at USAMRIID has allowed me to pursue many avenues of research that I may not have been able to investigate at other institutions**

ADVISER SUPPORT

10 Quality of mentoring from the Adviser
**Comments**
**Dr. Bavari recognized and acknowledged my previous experience and allowed me to pursue my research in an independent manner but was available for help and discussions as required. The perfect mentor for someone in my position.**

LPR SUPPORT

10 Quality administrative support from the LPR
**Comments**

NRC SUPPORT

10 Quality of administrative support from the NRC
**Comments**

18) *PLEASE PROVIDE ANY SUGGESTIONS FOR PROGRAM IMPROVEMENT.*

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# *FINAL REPORT*

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| **Warfield** | **Kelly** | **L** |

| 2) *FORWARDING Address* (to which your tax statement will be mailed) | *FORWARDING Phone(s) and E-Mail* (if known) |
|---|---|
| Res. or Inst.<br>Street **2640 Inwood Drive**<br>City, State Zip **Adamstown, MD 21710** | **Home Phone: (301) 874-2472**<br>**Alt. Phone: (301) 619-3414**<br>**E-mail: kelly.warfield@amedd.army.mil** |
| 3) *Today's Date*<br>**30Sep05** | *Dates of Tenure*<br>**from June 17, 2002 to September 30, 2005** |

| 4) *Agency* | *Laboratory or NASA Center* | *Division / Branch / Directorate* |
|---|---|---|
| **AMRMC** | **USAMRIID** | |

5) *Name of Research Associateship Programs Adviser*

**Sina Bavari**

6) *TITLE OF RESEARCH PROPOSAL*

**Study of vaccines and therapeutics for filoviruses**

7) *SUMMARY OF RESEARCH DURING TENURE* **Itemize significant findings in concise form, utilizing key concepts/words.**

**1) Investigated the ability of virus-like particles (VLPs) to be used as vaccines for filoviral infections. Developed Ebola and Marburg VLP vaccines and showed efficacy in rodents and nonhuman primates.**

**2) Evaluated antisense compounds as a therapeutic for filoviral infections in vitro and in vivo. Showed efficacy of antisense compounds in rodents and nonhuman primates.**

3)

4)

5)

8) *RESEARCH IN PROGRESS* **Describe in no more than 100 words.**

**Studies are being performed with mixtures of eVLP and mVLP used as a vaccine in non-human primates. We will assess the ability of this single vaccine to induce immune responses, determine if they are similar to the eVLP and mVLP, when administered alone, and finally we will determine the ability of the eVLP and mVLP pan-filovirus vaccine to protect against diverse filovirus challenges of EBOV and MARV in the nonhuman primate model. Studies are also currently underway in mice and guinea pigs to assess and optimize the route and dose of antisense compounds to prevent or treat EBOV and MARV infections. Future studies will include assessing the most promising candidates in non-human primates.**

9) *PUBLICATIONS AND PAPERS RESULTING FROM NATIONAL ACADEMIES ASSOCIATESHIP RESEARCH*

**Provide complete citations: author(s), title, full name of journal, volume number, page number(s), and year of publication.**

**a) Publications in peer-reviewed journals**

**Induction of humoral and CD8+ T cell responses are required for protection from lethal Ebola virus infection. Kelly L. Warfield, Gene Olinger, Emily M. Deal, Michael Bailey, Diane L. Negley, Dana L. Swenson, Mary Kate Hart, and Sina Bavari. 2005. J. Immunol. 175:1184-1191.**

**Human leukocyte antigen-DQ8 transgenic mice: A model to examine aerosolized Staphylococcal enterotoxin B toxicity. Chad J. Roy, Kelly L. Warfield, Brent C. Welcher, Raoul F. Gonzales, Tom Larsen, Julie Hanson, Chella S. David, Teresa Krakauer, and Sina Bavari. 2005. Infection and Immunity. 73(4):2452-2460.**

**Virus-like particles exhibit potential as a pan-filovirus vaccine for both Ebola and Marburg viral infections. Dana L. Swenson, Kelly L. Warfield, Diane L. Negley, Alan Schmaljohn, M. Javad Aman, and Sina Bavari. 2005. Vaccine. 23:3033-3042.**

Analysis of Ebola virus and VLP release using an immunocapture assay. George Kallstrom, Kelly L. Warfield, Dana L. Swenson, Shannon Mort, Rekha Panchal, Gordon Ruthel, Sina Bavari, and M. Javad Aman. 2005. J. Virol Methods. 127: 1-9.

Lactobacilli activate dendritic cells that skew T cells towards Th1 polarization. Mansour Mohamadzadeh, Scott Olson, Gordon Ruthel, Gretchen L. Demmin, Kelly L. Warfield, Sina Bavari, and Todd R. Klaenhammer. 2004. PNAS. 102(8):2880-2885.

Role of NK cells in innate protection against lethal Ebola virus infection. Kelly L. Warfield, Jeremy G. Perkins, Dana L. Swenson, Emily M. Deal, Catharine M. Bosio, M. Javad Aman, Wayne M. Yokoyama, Howard A. Young, and Sina Bavari. 2004. J Exp Med. 200(2): 1-12.

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Generation of virus-like particles and use as panfilovirus vaccine. Filed April 13, 2005. U.S. Application No. 11/105,031. Sina Bavari, M. Javad Aman, Alan L. Schmaljohn, Kelly L. Warfield, and Dana L. Swenson.

Activation of Natural Killer (NK) Cells and Methods of Use. Filed April 13, 2005. U.S. Application No. 11/105,056. Sina Bavari and Kelly L. Warfield.

Generation of virus-like particles and use as panfilovirus vaccine. Filed April 13, 2005. U.S. Application No. 11/105,057. Sina Bavari, M. Javad Aman, and Kelly L. Warfield.

11) *PRESENTATIONS AT SCIENTIFIC MEETINGS OR CONFERENCES*

**Provide complete references: author(s), title, abstract/proceeding citation, meeting name and location.**

**International**

**CpG activation of murine NK cells: Role of IL-12 secretion from eosinophils. Jeremy G. Perkins, Kelly L. Warfield, Debbie L. Hodge, and Howard A.Young. 2003 International Society for Interferon and Cytokine Research Meeting. October 2003. Australia.**

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**Ebola and Marburg virus-like particles efficiently activate human dendritic cells and inhibit viral replication. Catharine M. Bosio, Kelly L. Warfield, Javad M. Aman, and Sina Bavari. Linking Innate and Adaptive Immune Responses, 2002 Keystone Symposia. January 2003. Taos, New Mexico.**

**Generation of Marburg Virus-Like Particles by Co-expression of Glycoprotein and Matrix Protein. Dana L. Swenson, Kelly L. Warfield, Kathleen Kuehl, Thomas Larson, Michael Hevey, Alan Schmaljohn, Sina Bavari, and M. Javad Aman. ASM Biodefense Meeting. March 2003. Baltimore, Maryland.**

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**Filovirus-like particles as vaccines and discovery tools. Kelly L. Warfield, Dana L. Swenson, Diane Negley, M. Javad Aman, and Sina Bavari. Spring Research Festival. May 2005.**

12) *SEMINARS OR LECTURES DELIVERED AT UNIVERSITIES AND/OR INSTITUTES* **Include dates, names and locations of seminars.**

**2004 Lecturer for graduate level courses, George Mason and John Hopkins University**

13) *PROFESSIONAL AWARDS RECEIVED DURING TENURE*

14) *POST-TENURE POSITION TITLE*

**Subject Matter Expert I**

15) *POST-TENURE ORGANIZATION* **Provide name and address of organization.**

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16) *POST-TENURE POSITION STATUS / CATEGORY* **Please indicate only one.**

- ☐ Remain at Host Agency as Permanent Employee
- ☒ Remain at Host Agency as Contract/Temporary Employee
  **Abbreviate Host Laboratory/Center** **RIID**
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- ☐ Administrative Position at US Government Laboratory
- ☐ Research Position at Foreign Government Laboratory
- ☐ Research/Teaching at US College/University
- ☐ Research/Teaching at Foreign College/University
- ☐ Research/Administration in Industry
- ☐ Research/Administration in Non-Profit Organization
- ☐ Postdoctoral Research
- ☐ Self Employed
- ☐ Other: **specify** _____

17) *APPRAISAL OF RESEARCH ASSOCIATESHIP PROGRAM*
**On a scale of 1 – 10 (poor - excellent), please rate the following:**

SHORT TERM VALUE
10 Development of knowledge, skills, and research productivity
**Comments**

LONG TERM VALUE
10 How the National Academies Associateship award affected your career to date
**Comments**

LAB SUPPORT
10 Quality of support–equipment, funding, orientation, safety and health guidelines, etc.
**Comments**

ADVISER SUPPORT
10 Quality of mentoring from the Adviser
**Comments**

LPR SUPPORT
10 Quality administrative support from the LPR
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NRC SUPPORT
10 Quality of administrative support from the NRC
**Comments**

18) *PLEASE PROVIDE ANY SUGGESTIONS FOR PROGRAM IMPROVEMENT.*

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# *FINAL REPORT*

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| **Zollner** | **Gabriela** | **E** |

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| **USAMC-AFRIMS, APO AP 96546** | **Phone: 301-319-9000**<br>**Phone: 301-319-9012 (fax)**<br>**E-mail: zollnerge@afrims.org or gabyzollner@hotmail.com** |
| 3) *Today's Date*<br>**February 17, 2005** | *Dates of Tenure*<br>from **April 22, 2002** to **February 21, 2005** |

| 4) *Agency* | *Laboratory or NASA Center* | *Division / Branch / Directorate* |
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| **AMRMC** | **USAMC** | **AFRIMS** |

5) *Name of Research Associateship Programs Adviser*

**LTC James W. Jones, Ph.D.**

6) *TITLE OF RESEARCH PROPOSAL*

**Population dynamics of malaria sporogony in Thailand.**

7) *SUMMARY OF RESEARCH DURING TENURE* **Itemize significant findings in concise form, utilizing key concepts/words.**

**1) The first-generation (F1) progeny of wild-caught anophelines (from cow-baited traps) feed more readily when allowed to feed directly on human skin compared to feeding on human blood that has been placed in a membrane feeding system.**

**2) Following indirect membrane or direct mosquito feedings, gametocytemic patients are less infective to wild-caught mosquitoes than lab-colonized mosquitoes. The intensity of P. vivax (Pv) infection is unrelated to starting patient gametocytemia.**

**3) Immunofluorescent staining of Pv sexual stage parasites using anti-Pvs25 mAb is more effective than direct hemacytometer counts and Giemsa staining to determine absolute densities of ookinetes.**

**4) The development of mature Pv ookinetes in the midguts of lab-colonized An. dirus, An sawad. and An. minimus mosquitoes is asynchronous. Overall, parasite populations incur a 40-fold loss in abundance from the gametocyte to the oocyst lifestages.**

**5) Following membrane feeding with natural Pv isolates, the invasion of sporozoites into the salivary glands of An. dirus and An. minimus mosquito is highly efficient (approx. 75% and 60%, respectively).**

8) *RESEARCH IN PROGRESS* **Describe in no more than 100 words.**

**Studies to examined early P. vivax sporogonic development in wild-caught (vs. lab-colonized) mosquitoes will continue in Mae Sot (symptomatic malaria) and Kong Mong Tha (asymptomatic malaria).**

**Data analysis and publication of results relating to a large project, which aims to identify key host and mosquito factors that affect the transmission of falciparum and vivax malaria in western Thailand, are currently underway. A series of 5+ papers derived from this project will be published in 2005-06.**

9) *PUBLICATIONS AND PAPERS RESULTING FROM NATIONAL ACADEMIES ASSOCIATESHIP RESEARCH*

**Provide complete citations: author(s), title, full name of journal, volume number, page number(s), and year of publication.**

**a) Publications in peer-reviewed journals**

**Sattabongkot, J, T Tsuboi, GE Zollner, J Sirichaisinthop & L Cui. Plasmodium vivax transmission: Chances for control? Trends in Parasitology 20(4): 192-198. 2004.**

**Zollner GE, N Ponsa, RE Coleman, J Sattabongkot & JA Vaughan. Evaluation of techniques to determine absolute density of Plasmodium vivax ookinetes. Journal of Parasitology. 2005 (In Press)**

**b) Books, book chapters, other publications**

**None**

c) Manuscripts in preparation, manuscripts submitted

**Zollner GE, N Ponsa, RE Coleman, J Sattabongkot & JA Vaughan. Efficiency of Plasmodium vivax early sporogonic development in three species of colonized Anopheles mosquitoes in Thailand. 2005.**

**Zollner GE, G Garman, N Ponsa, RE Coleman, J Sattabongkot & JA Vaughan. Quantitative kinetics of Plasmodium vivax sporozoite invasion into the salivary glands of three Anopheles spp. 2005.**

10 *PATENT OR COPYRIGHT APPLICATIONS RESULTING FROM NATIONAL ACADEMIES ASSOCIATESHIP RESEARCH*

**Provide titles, inventors, and dates of applications.**

**None**

11) *PRESENTATIONS AT SCIENTIFIC MEETINGS OR CONFERENCES*

**Provide complete references: author(s), title, abstract/proceeding citation, meeting name and location.**

**International**

- **Zollner GE, N Ponsa, J Sattabongkot, RE Coleman, J Jones & JA Vaughan. 2004. Estimates of Plasmodium vivax gametocyte fertility and ookinete transformation in Anopheles dirus mosquitoes. 53rd Annual Meeting of the American Society of Tropical Medicine and Hygiene, Miami, FL.**
- **Zollner GE, B Jaichapor, P Kankaew, R Sithiprasasna, J Sattabongkot, J Jones, JA Vaughan, RE Coleman. 2004. Malaria in an isolated Karen village in western Thailand: Bionomics of adult anopheline mosquitoes. 53rd Annual Meeting of the American Society of Tropical Medicine and Hygiene, Miami, FL.**
- **Zollner GE, G Garman, N Ponsa, RE Coleman, J Sattabongkot, J Jones & JA Vaughan. 2003. Quantitative kinetics of sporozoite invasion into mosquito salivary glands. 52nd Annual Meeting of the American Society of Tropical Medicine and Hygiene, Philadelphia, PA.**
- **Zollner GE, N Ponsa, RE Coleman, J Sattabongkot, J Jones & JA Vaughan. 2003. Quantitative kinetics of Plasmodium vivax ookinete formation in three Anopheles spp. 52nd Annual Meeting of the American Society of Tropical Medicine and Hygiene, Philadelphia, PA.**
- **Zollner GE, R Sithiprasasna, J Nigro, P Masouka, L Robert, D Roberts, P Khankaew & RE Coleman. 2002. Focality of adult and larval anopheline mosquitoes in a malaria endemic village in western Thailand. Annual Meeting of the American Society of Tropical Medicine and Hygiene, Denver, CO.**
- **Zollner GE, RE Coleman & JA Vaughan. 2002. Efficacy of sampling techniques for determining absolute density of Plasmodium vivax ookinetes in Anopheles dirus mosquitoes. Annual Meeting of the American Society of Tropical Medicine and Hygiene, Denver, CO.**

**Domestic**

- **Zollner GE, N Ponsa, J Sattabongkot, RE Coleman, JW Jones & JA Vaughan. 2004. Estimates of Plasmodium vivax gametocyte fertility and ookinete transformation in Anopheles dirus, An. An. minimus and An. sawadwongporni mosquitoes. Joint International Tropical Medicine Meeting, Bangkok, Thailand.**
- **Ponsa N, GE Zollner, J Sattabongkot, RE Coleman, JW Jones & JA Vaughan. 2003. Quantitative kinetics of Plasmodium vivax ookinete formation in three Anopheles spp. Joint International Tropical Medicine Meeting, Bangkok, Thailand.**
- **Zollner GE, RE Coleman, R Sithiprasasna & J Jones. 2003. Preliminary evaluation of the Mosquito Magnet trap in a malaria endemic village in western Thailand. Asia-Pacific Military Medicine Conference XIII, Bangkok, Thailand.**

12) *SEMINARS OR LECTURES DELIVERED AT UNIVERSITIES AND/OR INSTITUTES* **Include dates, names and locations of seminars.**

- **2005. Mosquito acquisition of malaria in an isolated village in western Thailand: A longitudinal study. USAMC-AFRIMS, Bangkok, Thailand.**
- **2004. Malaria transmission in a remote village in western Thailand: An entomological perspective. National Institute of Allergy and Infectious Diseases, Rockville, MD.**
- **2003. Malaria studies in Thailand. Biology Department, University of North Dakota, Grand Forks, ND.**

13) *PROFESSIONAL AWARDS RECEIVED DURING TENURE*

**None**

14) *POST-TENURE POSITION TITLE*

**Research Entomologist**

15) *POST-TENURE ORGANIZATION* **Provide name and address of organization.**

**Department of Entomology, WRAIR, 503 Robert Grant Ave, Silver Spring, MD 20910**

16) *POST-TENURE POSITION STATUS / CATEGORY* **Please indicate only one.**

☐ Remain at Host Agency as Permanent Employee
☐ Remain at Host Agency as Contract/Temporary Employee
**Abbreviate Host Laboratory/Center** AFRIMS
☒ Research Position at Another US Government Laboratory
☐ Administrative Position at US Government Laboratory
☐ Research Position at Foreign Government Laboratory
☐ Research/Teaching at US College/University
☐ Research/Teaching at Foreign College/University
☐ Research/Administration in Industry
☐ Research/Administration in Non-Profit Organization
☐ Postdoctoral Research
☐ Self Employed
☐ Other: **specify** _____

17) *APPRAISAL OF RESEARCJ ASSOCIATESHIP PROGRAM* **Please rate each of the following on a scale of 1 (poor) to 10 (excellent).**

**Your experience as a National Academies Research Associate in this federal Laboratory**

8 Short-term value: development of knowledge, skills, and research productivity
**Comments:**
**During my tenure I developed many entomology, parasitology and molecular biology skills related to my project. I also acquired several skills (e.g. diplomacy and networking) whose importance I only began to realize later on. AFRIMS provided a highly productive research environment, but there were not many opportunities for intellectual discourse with AFRIMS staff.**

10 Long-term value: how the National Academies Associateship award affected your career to date
**Comments:**
**My Associateship Award is a solid stepping stone to another exciting and challenging position as a Research Entomologist at WRAIR (Dept. of Entomology).**

**Administrative Support**

10 Quality of the support you received from the federal Laboratory

7 Quality of the support you received from the Research Associateship Programs staff **(Leave blank, if not applicable – e.g., NIST)**
**Comments:**
**At the beginning of my tenure at AFRIMS, the quality of support from RAP staff was hampered by a lack of information in processing administrative matters for NRC Associates based overseas. RAP support improved immensely once a system was in place.**

18) *PLEASE PROVIDE ANY SUGGESTIONS FOR PROGRAM IMPROVEMENT.*

**The NRC Associateship Program is invaluable for the career development of young postdocs. To ensure the continued success of the Program, it is important that NRC Associates work in an environment that is intellectually stimulating.**